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REPORT

ON THE

PRYBILOV GROUP, OR SEAL ISLANDS, OF ALASKA.

BY

HENRY W. ELLIOTT,
ASSISTANT AGENT TREASURY DEPARTMENT.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1873.

St. Paul's Island
Pribilov Group.
Bering Sea. AT.

"Showing the position & area of the Fur Seal "Rookeries."

(Surveyed in May 1872.)

Henry W. Elliott.

STATUTE MILES.

Ground covered by the Breeding Seals (Callorhinus ursinus.) "Rookeries"

"Hauling Grounds" of the Fur Seals. (D² D³)

Area of Island, 33 sq. miles; 42 m. of Shore Line; 7½ of which was occupied by the Breeding Seals, Season of 1872.

St. George's Island.

(Prybilov Islands.)
Bering Sea.
A. T.

LETTER TO THE SECRETARY OF THE TREASURY.

WASHINGTON, D. C., *November* 1, 1873.

SIR: I have the honor to submit the following report upon the Prybilov Group of Seal Islands, prepared while residing on these Islands as an officer of the Government in 1872–73.

As the ground covered in this report is new, not only to the popular but to the scientific world, I have on my part spared no personal exertion whatever that should tend to make my work both correct and exhaustive. It is only to be regretted that definite information concerning these singular and important Islands, and the interests of the Government upon them, should have been left to this late date for publication.

This report is presented, with illustrations, in sections, and arranged in the following order, viz:

1. THE PRYBILOV ISLANDS; *their position, climatology, formation, &c., &c.*
2. THE PEOPLE ON THE ISLANDS; *their origin, mode of living in the past, present condition, &c.*
3. THE BEARING OF THE LEASING PRINCIPLE UPON THE ISLANDS.
4. THE SEAL-LIFE ON THE ISLANDS.
5. THE EXTENT, IMPORTANCE, AND MANAGEMENT OF THE SEALING INTERESTS ON THE ISLANDS.
6. APPENDIX.

The illustrations were all made by myself from studies upon the Islands, and executed with especial reference to fidelity in coloring and accuracy of outline. They present a clearer view of the Islands and the life upon them than I can give with the pen alone, and have been made with that object.

I have the honor to be, very respectfully, your obedient servant,

HENRY W. ELLIOTT,
Assistant Agent Treasury Department.

Hon. WILLIAM A. RICHARDSON,
Secretary of the Treasury.

INTRODUCTION.

THE FUR-SEALS AT THE PRYBILOV ISLANDS, BEHRING SEA, ALASKA.

To an old proverb, "There is nothing new under the sun," these Islands return quite as emphatic a negative to the traveler as can any other place on the face of the earth, and lying, as they do, up within the immediate influence of that zone which is usually accredited with only dreary and forbidding uninterestingness, they are certainly well placed on the world's chart for the astonishment of the visitor who may be fortunate enough to behold, as has the writer, the wonderful exhibition of life on their rocky shores.

Many years previous to the discovery of the Prybilov Group, the Russian-American Fur Company's trading posts in the Aleutian Archipelago were in the habit of receiving the skins of the fur-seal *(Callorhinus ursinus)* in limited numbers from the natives, who captured this animal as it appeared every year in the spring and autumn passing north, and subsequently south, through the narrow channels, straits, &c., between the Aleutian Islands. The regular routine of travel followed by these animals year after year, going north and coming south, induced one G. Prybilov, a ship's mate in the service of a "swan-hunting[1] company," at Ounalaska, to think it well worth while to make a voyage of exploration into Behring Sea, and search among the Islands there already known, and for those that might be unknown, in order to find, if possible, the breeding-haunts of this valuable seal; and these Islands now under discussion were found and taken possession of in the Russian name in 1786–'87. They were without population, or the traces, even, of human habitation.

According to Bishop Veniaminov, the Island of Saint George was first discovered and named after the little vessel commanded by Prybilov, and in the following year, July, 1787, the Island of Saint Paul was noticed by the men stationed at Saint George, looming on the horizon twenty-seven miles distant to the northwest. It was at once taken possession of in the same manner by the Russians, who found, however, at Southwest Bay, traces only of the presence of men who had been but recently on the ground before them.[1]

[1] Veniaminov's "Zapeeskie," &c., 1840. See Appendix.

SITKA.

From Japan Island—October 10, 1866.

The Russian-American Fur Company immediately organized a colony of "one hundred and thirty-seven souls" at Sitka and Ounalaska, principally natives of the latter place, and planted the settlements which still exist on the Seal Islands. These colonists[1] were under the supervision of the Russian Fur Company's agents, who directed and rewarded all their labor connected with the sealing business and interests. They were at first provided with a priest, as they were all members of the Greek Catholic Church, and a house for them to worship in was subsequently built. They were visited once or twice a year at least by vessels of the company, which brought them the necessaries and some luxuries of life; and after many years of irregular and indiscriminate management of the sealing business, they came to regard it with so good an eye to its preservation and perpetuation that their rules and regulations in regard to these points are still in force, no subsequent observation by either Russian or American agents having suggested an improvement upon them up to the date of the writer's arrival on the Islands, April, 1872.

This general managemeut of the Russians was satisfactory to them. They had no such call nor received such cash value for seal-pelts as the world's market now affords, and the INCREASE of the business was not taken into consideration, as far as I can learn; and if it was, they were far from the right policy, in my opinion.

Too much credit, however, cannot be given to certain agents[2] of the Russian Fur Company, who have by their attention and action saved this most interesting and valuable exhibition of animal life from the wanton, improvident destruction which has been visited upon the great fur-seal rookeries of the southern ocean.

Grateful mention is also due to a countryman of ours, whose precept and example on these Islands, during a portion of that unsettled and lawless period which intervened between the time of transfer of the Territory and the granting of the lease, are worthy of praise and public acknowledgment.[3]

The only other islands visited by the fur-seal lie to the westward of the Prybilov Group, within the Russian boundary. They are known as Behring and Copper Islands and Robben's Reef, (the latter a small rock in the Kurile Group,) but no definite knowledge has been, as yet, obtained concerning the extent and importance of the sealing interests there, for comparison with those of our own, which are presented for the first time in this report. From the nature of the vague statements made in regard to them, it might be surmised that they are not frequented by the fur-seal to any great number.

I deem it highly desirable, therefore, that the Treasury Department should possess definite knowledge of these islands, in order that the relative value of the American and Russian sealing interests in the North Pacific and Behring Sea may be correctly known, and that early movement toward the acquisition of this information be made.

[1] See Appendix, Veniaminov's "Zapeeskie," &c.

[2] See Appendix, Bishop Veniaminov's account, &c.

[3] H. M. Hutchinson.

THE POSITION OF THE PRYBILOV ISLANDS.—CLIMATOLOGY, FORMATION, NATURAL HISTORY, ETC.

By reference to a good chart of Behring Sea and the Alaskan shore, it will be seen that the Prybilov Group occupies the most isolated position of any land in that water; that the Islands lie out in the heart, as it were, of Behring Sea, the three nearest land-points to them being nearly equidistant—Saint Matthew's Island and Nunivak, Cape Newenham, on the main-land, and Ounalaska, all about one hundred and eighty miles off; and in this location ocean-currents, warmer than the normal temperature of the latitude, setting up from the south, on their way to the Arctic and elsewhere, give rise during the summer months and early autumn to constant thick, humid fogs and drizzling mists, which hang in heavy banks over Islands and sea, seldom breaking open and away to indicate a clear and pleasant day.

By the middle or end of October, high winds and colder carry off the moisture, clearing up the air, and along by the end of January or early in February usually bring down from the north and northwest great fields of broken ice, not very heavy or thick, but still covering the whole surface of the sea, shutting the land in completely, and silently hushing the wonted roar of the surf for a month or six weeks at a time; and then again, in exceptionally cold seasons, three and even four months will be an ice-bound record; winters have occurred without the sight even of an ice-floe, but this is seldom so.

The breaking up of winter weather usually sets in about the first week in April, the ice leaving or dissolving at that time or a little later, so that by the 1st or 5th of May, generally, the beaches and rocky sea-margins are clear and free from ice and snow, although snow still lies in the gullies back and leeward hill-slopes, where it has drifted during the winter, until the end of July and middle of August, sometimes.

Fogs, damp and thick, close in about the end of May, and this, the usual routine of summer, sets in and holds on steadily until the middle or end of October.[1]

The periods of change are exceedingly irregular in autumn and spring, but in summer the uniformity of the weather, with cool, moist, shady, gray fog, is constant, and to this certainty of favorable climate, coupled with the perfect isolation and fitness of the ground, is due, without doubt, the preference for it manifested by the warm-blooded animals which come here every year, to the practical exclusion of all other ground, in hundreds of thousands and millions, to breed, shed their coats, &c.

[1] See Appendix.

UNALASKA VILLAGE AND HARBOR.

From the S. E.—April 22, 1872.

The formation of these Islands was recent, geologically speaking, and, in my opinion, due to volcanic agency direct, which lifted them gradually up from the sea-bed, building upon them below the water's level, and subsequently above, with here and there a spout-hole or crater, from which water-puddled breccia and volcanic ashes and tufa were vomited. Soon after the elevation of this igneous matter all volcanic action must have ceased, though the cleanly blown-out throat and smooth funnel-like walls of a crater on Otter Island (one of the Group, five miles south of Saint Paul's) would seem to indicate quite recent action, and this is the only place on the Prybilov Islands where anything has been discharged from a crater at so late a date.

Since the period of the upheaval of the Group under discussion, the sea has done much to modify and enlarge the most important Island, Saint Paul's, while the others, Saint George and Otter, being lifted abruptly above the power of water to carry, and ice to deposit, sand, soil, and boulders, are but little changed.

Saint Paul's Island is the largest and by far the most important of the whole Group. Upon my arrival there in April, 1872, I was surprised to find that no accurate or even approximately correct map had ever been made of it. I therefore immediately set to work upon a careful survey of the Island, and give herewith, as the result of this labor, the first definite figures as to its dimensions and area, together with a map showing outline and topography, the area and position of the fur-seal "rookeries"[1] and hauling-grounds, &c.

The Reef Point of the island stands in latitude[2] 57°08′ north, longitude 170°12′ west, being the most southerly land. The Island is in its greatest length, between Northeast and Southwest Points, twelve and a half miles, air-line, and in greatest width a little less than six. It has a superficial area of about thirty-three square miles, or twenty-one thousand one hundred and twenty acres of diversified rough and rocky uplands, setting down boldly to the sea, or fading into wet, basaltic, mossy flats and dry sand-dune tracts; it has forty-two miles of shore-line, sixteen and a half of which were hauled[3] over *en masse* by the fur-seals during the season of 1872.

At the time of its first appearance above the sea it must have consisted of ten or twelve rocky bluff islets, or points, upon some of which were craters sending forth breccia and cinders, but with little or no lava overflowing.

The plutonic power after this ceased to act, and the sea commenced the work of building on to the skeleton thus created, and to-day, so thorough has it been in its labor of sand-shifting, together with the aid of ice-floes in their action of grinding, lifting, and shoving, that most all of these scattered islets, within the present area of the Island, are completely bound together by bars of sand and boulders, which are raised above the highest tides by wind taking the sand up from the wash of the waves, and rocks lifted and pushed up there by ice-fields.

The sand which has played so important a part in the formation of Saint Paul's Island, and which is almost entirely

[1] "Rookeries;" *i. e.*, breeding-grounds. [2] According to Archimandritov: Alaska Coast Pilot, part i, 1869.

[3] Sealer's phrase, equivalent to walked over, &c., &c.; it is expressive of the *hauling* movement of the seals on land, as they move.

absent on and around the others in this Group, is largely composed of *foraminifera*, together with *diatomacea*, mixed in with the volcanic base. It changes color like a chameleon as it passes from wet to dry, being a rich steely black at the surf-margin, then drying out to a soft grayish brown, succeeding to tints most delicate, of reddish and pale gray when warm and drifting with the wind; it is upon the sand-flats and hill-sides where sand has been drifted that the most luxuriant vegetation exists.

As these sand and boulder bars and peninsulars were forming on Saint Paul's, they, in making across from islet to islet, shut in small bodies of sea-water, thus giving rise to a number of lakes, which have nearly all become fresh; by reference to the map it will be at once seen how well supplied the Island is with fresh water; there are in them no reptiles or fish, but a great number of minute *rotifera* sport about at all seasons of the year when the water can be examined. A single univalve and one bivalve are the only molluscans that I have been able to find in them, but I have not had the time to give them as thorough an examination as they deserve. Several water-plants and algae flourish, however, especially so in the large lake Mee-sulk-mah-nee. I am confident that more of great interest to naturalists will be found in these lakes if they are all carefully examined.

Saint George's Island comes next in order of importance and size, and, as at Saint Paul's, I found the same want of definite knowledge as to its size, shape, &c., when I visited the island, June, 1873; and a survey which I immediately made after my arrival on the ground gives it not quite ten and a half miles of greatest length, air line, with a breadth of less than four and a quarter at greatest width. It has an area of about twenty-seven square miles, or seventeen thousand two hundred and eighty acres; has twenty-nine miles of shore-line, only two and a quarter of which are hauled over by the fur-seal, it being, in fact, all the eligible range of landing afforded them by the structure of the Island, which rises every-where else abruptly from the water that breaks boldly on the bases of the high cliffs all around, save at Zapadnee landing, on the south side, and the sea-lion ground on the east, where these animals are in quiet possession of less than half a mile of good landing.

Tolstoi Mees lies in north latitude 56°37′01″, and the west end, or *Dalnoi Mees*, 56°38′03″, with west longitudes of 169°27′ and 169°44′, respectively.[1]

On the north shore of the island, three miles west from the village, a grand bluff wall of basalt and tufa intercalated rises abruptly from the sea to a height of 920 feet at the point of greatest elevation, in its length of over a mile and a half, upon the face of which hundreds of thousands of water-fowl breed during the summer months.

By reference to my maps it will be seen that the general elevation of the Islands is not great above the sea; that the highest points on Saint George are only 920 and 930 feet, and *Bogus Slov* hill, on Saint Paul's, but 600. All elevations over

[1] These positions are from Archimandritov's MSS., Coast Pilot of Alaska, 1869.

THE VILLAGE HILL, ST. PAUL'S ISLAND.

From the Steamer's anchorage in Zotoi Bay—Native "Bidarrah"—August 15, 1872.

10 or 20 feet above the sea, on either island, are rough, hummocky, and rocky. Saint George has a mean elevation nearly three times greater than the lay of the land on Saint Paul's, which is quite low on an average and relatively very much smoother, both being undulatory and rolling.

The supply of water is abundant and good, but the area of the Island covered by fresh water is very much less than on Saint Paul's. These little lakes on both islands are covered by thousands of gulls, which seem to take delight in sitting sleepily upon their quiet surfaces, or to wash and dress their plumage.

The black-brown tufa and breccia bluffs at the East Landing, Saint Paul's Island, rise abruptly from the sea some 60 or 80 feet, with stratified horizontal bands of a light gray calcareous conglomerate or cement, in which are imbedded sundry fossils characteristic of the Tertiary age, such as *Cardium groenlandicum*, *decoratum*, *Astarte pectuncula*, &c. This is the only locality on the Prybilov Islands where paleontological evidence can be found.

Weathered or washed out from the basalt and pockets of *olivine* on the islands are aggregates of *augite*, seen most abundantly on Ahlucheyak Hill, Saint George. Specimens, from the stratified bands of old friable gray lavas, so conspicuous on the bluffs of the north shore of this Island, show the existence of hornblende and vitreous feldspar in small quantities, while on the south shore, near the Garden Cove, is a large dike of a bluish and greenish-gray phonolitic rock, in which numerous small crystals of spinel are found. A dike with well-defined walls of old close-grained clay-colored lava is close by the village at Saint George, in the face of the breccia bluffs rising from the beach, about a quarter of a mile east from the landing and salt-houses; its trend is northeast and southwest, and is the only example of its kind met with here.

The foundations of the Islands are basalt, some very compact and grayish-white, but most of it is exceedingly porous and ferrugineous, and upon this solid floor are many hills of brown and red basaltic tufas. Polavina Sopka, the second point in elevation (550 feet) on Saint Paul's, is almost entirely built up of red scoriæ and breccia, the bluffs at the shore, Polavina Point, showing the hard basaltic underpinning upon which the hill rests. These tufas on both islands decompose and weather into fertile soil. There is not a trace of a granitic or gneissic rock found in *situ*. Several metamorphic boulders have been collected, which were evidently dropped upon the beaches by ice-floes driven down by the wind, strong northwesters, from the Asiatic coast.

Otter Island ranks third in the Group, and lies five miles south-southwest from the Reef Point of Saint Paul's Island, in latitude 57°03′, longitude 107°19′. It is but about three-quarters of a mile in greatest length by less than half a mile in greatest width. The east, south, and west shores are bold and bluffy, not to be approached by men or seals for the purpose of landing in rough weather; but the north shore rises, for most of its extent, quite gradually from the margin of the surf, which is, however, broken and rocky—no sand-beach.

The highest point on the Island is the summit of the bluffs on the west shore, and I estimate it at 250 to 300 feet A

small lake, very shallow, lies close down and by the north shore and landing; the water is impure and unreliable, the lake being dry in some seasons.

There is here an important rookery of the fur-seal, together with a large number of sea-lions; but I was unable to make a second visit to this Island at the proper time to finish my survey, so that I cannot give definite figures as to its seal population, such as I have given on the maps of the other Islands.

Walrus Island, fourth and last, is of little or no commercial importance, but exceedingly interesting. It is a mere rock, elevated but slightly above the surf, less than a quarter of a mile in length and a few hundred yards in width; latitude 57°11′05″ north, longitude 169°49′05″ west.

It is scarcely resorted to by the fur-seals, but several hundred bull-walrus (*Rosmarus*) are to be found here most of the year, and a few sea-lions breed also; but the Island is seldom visited by the people on Saint Paul's, and then only during the egg season, in June and July; the ground is then literally covered by water-fowl, breeding. This rock lies six miles to the east and south of east from the northeast point of Saint Paul's Island. There is no fresh water upon it.

On account of the splendid opportunity and facility of viewing the walrus herds, together with sea-lions and the innumerable water-fowl at the nesting season, this little Island is one of the most interesting localities in the country.

Vegetation on these islands, Walrus Island excepted, such as it is, is fresh and luxuriant during the growing season of June and July, and early August; but the beauty of trees and shrubbery, and their economic value, is denied by the climatic conditions[1]; there are, however, ten or twelve species of grasses, growing in every variety, from close curly compact tufts, to tall stalks standing, in favorable seasons, waist-high; the "wild wheat" of early visitors to Alaska, *(Elymus,)* with stems four and five feet in height, together with over a hundred species of annuals, perennials, sphagnum and other cryptogamic plants, all flourishing in their respective positions, and covering everything upon which a plant can grow with a living coat of green, the greenest of all greens, giving, so pure is it, a blue tint to gray shadows in the summer, and bronzing into a rich purple in some places on the sand-dune tracts during the autumn, contrasting pleasantly with the innumerable blue, yellow, and pink and white blossoms everywhere interspersed, while I have frequently found, by looking closely into several of the deep, dark masses of verdure on Saint Paul's Island, the familiar face of the violet.

The floral display is not near so profuse or varied on Saint George as on Saint Paul's, owing chiefly to the absence from the first-named Island of all the warm sand-dune tracts so characteristic of the latter.

[1] I am strongly inclined to believe that several of the most hardy shrubs and spruce or fir-trees, indigenous at Sitka or Kodiak, and the mountains of their vicinity, would grow if transplanted properly on some of the southern hill-slopes most favored by soil and position, at Saint Paul and Saint George; but they would not have sunlight enough to ripen their seed, so that reproduction of their kind would not follow.

THE NORTH SHORE OF ST. GEORGE.

Characteristic foggy atmosphere of the Islands—July 14, 1873.

THE INSECT WORLD, represented by a large flesh-fly, *(Musca,)* appears in a very striking manner upon the rank luxuriant masses of sedge-grass, which flourish on the killing-grounds, springing up in the growing season with almost magical rapidity. This fly is covered with a bluish-gray down and is very quiet and inoffensive, seldom ever getting into the houses; it settles upon the long grass stems and leaf-blades by tens of millions, causing the verdure over the whole slaughtering-district and vicinity to fairly droop to the earth with its burden of insectuous weight; and at a slight distance the field looks as though a shower of paste had been thrown upon it and had become very mouldy; a gnat *(Culex)* flits about, taking shelter in the grass, but never annoys man, so that virtually there are no mosquitoes on the Islands. The common house-fly is never seen in the dwellings or elsewhere on the Islands.

By the end of August, and first week in September, of ordinary seasons, the small edible berries found on the uplands *(Empetrum nigrum* and *Rubus chamaemorus)* are ripe, and this period is also the close of the general flowering season. These berries furnish the only indigenous fruit the Seal Islands afford, the first being small, watery, and black, about the size and shape of an English currant, and the other putting one in mind of an unripe and partly decayed raspberry.

As might be inferred from their formation, these Islands possess no mineral wealth of commercial or economic value.

Aside from the seal-life on the Prybilov Islands there is no indigenous mammalia, with the exception of a small lemming, *(Myodes obensis* ——,) and blue and white cross foxes, *(Vulpes lagopus;)* the former being restricted, singularly enough, to the Island of Saint George, where it is exceedingly abundant; its burrows and paths under and among the grassy hummocks and mossy flats literally checker every square rod of land there covered with this vegetation; and although Saint Paul's Island lies but twenty-seven miles to the northwest, not a single one of these active, curious little animals has ever been found there.

The foxes find among the countless chinks and crevices in the basaltic formation, comfortable holes and caverns for their accommodation and retreat, feeding fat upon sick and pup seals, as well as water-fowl and eggs, during the summer and autumn, living through the winter on the dead bodies of seals left upon the rookeries, and their carcasses on the killing-grounds.

The Islands have, thus far, escaped from any visitation of rats, but mice have been brought from the ships and are great pests in the winter.

Stock cannot be profitably raised on these Islands, the proportion of severe winter is too great, when, during three and four months in such season, they would require feeding and watering, together with shelter; supplying animals with hay and grain brought up from San Francisco is a costly matter, and the dampness of the growing or summer season, on both Islands, renders hay-curing impracticable.

Perhaps hardy Siberian cattle might pick up a living all through a rough winter on the north shore of Saint Paul, among the grassy sand-dunes there, with nothing more than shelter and water given them, but they will scarcely pay, as

the winter grazing-ground would not support any great number of animals, being less than two square miles, and half of this area is unproductive.

I am strongly inclined to think that reindeer would make a successful issue with any struggle here that they might have for existence, and be the source of an excellent supply, summer and winter, of fresh meat for the agents of the Government and Company, who may be living upon the Islands.

The Russians, as well as the Alaska Commercial Company at present, were in the habit of keeping a few head of cattle and a number of hogs and chickens through the winters, but it is without profit, and requires a great deal of care and attention.

In the Appendix will be found a detailed chapter upon the [1]Ornithology of these Islands, which is of much interest; but the great exhibition of Pinnipedia overshadows, throwing abruptly into the background everything, animate or inanimate, on these Islands. Still the spectacle of birds nesting and breeding on Saint George's Island, to the number of millions, flecking the high basaltic bluffs (a shore-line twenty miles in length) black, brown, and white, as they perch or cling to the cliffs in the labor of incubation, is a sight of exceeding interest and constant novelty, affording the naturalist opportunity for observation and investigation into the most minute details of the reproduction of these vast flocks of circumboreal water-fowl.

Saint Paul's Island, owing to the low character of its shore-line, a large portion of which is but slightly elevated above the sea, and sandy, is not visited by such myriads [2]as are seen at Saint George; but the small rock known as Walrus Island, in this Group, is fairly covered with sea-birds, while the Otter Island bluffs are crowded to their utmost capacity. The variety in these millions of breeding-birds is not great, since it consists of only ten or twelve species, and the whole list belonging to the Prybilov Islands, stragglers and migratory, contains but thirty-eight names. Conspicuous among the last-named class is the robin, which was brought from the main land, evidently against its will, by a storm or gale of wind, as must also be the case with the solitary hawks and owls occasionally noticed here.

After the dead-silence of a long ice-bound winter, the arrival in the spring of large, noisy flocks of the "tchooch-kie" (*Phaleris microceros*) is most cheerful and interesting. These are bright, fearless little birds, with bodies generally plump and fat, coming usually by the 1st or 5th of May; they are caught by the people, to any number required, in hand scoop-nets, while flying to and from their nests, made in cliff-chinks, crevices, and among boulders. They are succeeded, from a culinary point of view, in July, by large flocks of turnstones, (*Strepsilas interpres*,) which come from the west or north, where they have been breeding, and stop on the Islands for a month or six weeks to feed fat upon the flesh-flies, and their

[1] Prepared by Dr. Elliott Cones, from my biographies, notes, and collections.

[2] The greatest egg-ground is at *Ein-ah-nuh-to* Bluffs, at the west end of the Island, where, however, the rocks are crumbling and treacherous, rendering it very unsafe for the hunters.

THE VILLAGE, ST. PAUL'S ISLAND.

Looking south over the Village cove—July 17, 1872.

eggs, which swarm over the killing-grounds. These handsome, red-legged birds go familiarly among the seals, catching flies, gnats, &c. They are succeeded, in September and October, by several species of jack-snipe, (*Tringa and Charadrius*,) which, however, leave towards the end of this month and early in November, and when winter fairly closes in upon the Islands, the loud roaring, and incessant seal-din, together with the screams of innumerable water-fowl, are succeeded by absolute silence, marking out, as it were, summer's life and winter's death, in lines of abrupt and vivid contrast.

I have been unable to discover a single representative of the reptiles on the Islands, and a small list only of fishes and molluscans rewarded the most careful search. The presence of the seals in the water about the Islands in such great numbers during five and six months of every year renders all kinds of fishing-trips abortive, with one exception, made within a radius of at least five miles from land; and after these animals leave, in November and December, up to the time of their re-appearance again, in May and June, the weather is usually too stormy or cold for the fishermen of the Islands, who venture out, however, during July and August, in their small kyacks or bidarkies to get the halibut, and meet with some success, catching this bottom-fish in fifteen to twenty fathoms of water. They frequently find in its maw several species of *Octopi*, (cuttle-fish and squids,) together with crabs, &c.[1]

The *Annulosa* are represented by great numbers of *Errantia*, (sand-worms,) and, in quiet eddies, the *Crustacea* by large swarms of *Cypris* (water-fleas) and *Daphnia*. A fine crab is at certain seasons exceedingly abundant and is excellent for the table, and a small hermit-crab (*Pagurus*) is found quite common in the empty whelk-shells at the tide margin; also great numbers of various *Amphipoda*, or sea-shrimps, whale-feed, &c.

The sub-kingdom of *Annuloidæ* is fairly shown by several species of *Echinoidea*, (sea-eggs, or urchins,) and by numerous representatives of the *Scolecidæ* class. The natives make regular search for the sea-urchins during fair weather and at low water, esteeming them very highly as an article of food.

But the sea is filled with *Hydroids* (sea-firs, &c.) and *Discophora*, (jelly-fish,) which at certain times of the year and after heavy gales lie rotting by millions upon the rocks and beaches, where they have been thrown up by the surf; and with large variety of *Actinidæ* (sea-anemones, &c.) The *Protozoic* classes of *Rhizopoda* and *Infusoria* fairly swarm in the waters about the Islands, while forests of *Algæ* (sea-weeds) are found here in every nook and corner covered by the sea, and a terrestrial species, a silken-green *Confervæ*, flourishes over the decaying vegetable and animal matter on the killing-grounds. All three divisions in this great order, *Melanospermæ*, *Rhodospermæ*, and *Chlorospermæ*, are present, the first-named being, however, the most abundant, and upon decaying heaps of it, countless numbers of a common *Buccinnoid*, or whelk, feed by boring or sucking out myriads of tiny holes in the leaf-fronds.

[1] Since the submission of this report the Secretary of the Treasury, Mr. Richardson, has suggested that, as several of the fresh-water lakes do not freeze to the bottom during the winter, the experiment be made of stocking them with fish by the method now in use for Pisciculture, and as practiced by the Un ited States Fish Commission.

THE INHABITANTS OF THE PRYBILOV ISLANDS.

The term "natives" can hardly be applied to these people, for they came from both hemispheres originally, (and not long ago,) and have been constantly changing back and forth. They are of mixed blood, almost without exception, and I doubt the existence of a pure Aleut among them to-day.

These people, in common with all the servants of the Russian Fur Company, were mainly of Aleutian derivation, but they have been mixed so with Russian, Koloshian, and Kamschadale blood, etc., that they present characteristics, in one way or another, of the five great races of men, from the Negro up to the Caucasian. The predominant features among them are small, wide-set, dark eyes; broad and high cheek-bones, causing the jaw, which is medium, to appear somewhat peaked; coarse, straight, black hair, together with a dark-olive complexion. They average in stature five feet five or six inches, although there are several men six feet and over, while on the other hand many are quite dwarfish.

Only a small proportion of the present population are descendants of the pioneers, who were brought by the Russian-American Company to the Islands in 1786–'87, a colony of "one hundred and thirty-seven souls," organized at Sitka and principally recruited from the Aleuts at Ounalaska. Their early life here, compared with the present, was one of much hardship, and on several occasions they were in actual need. They lived in a co-operative manner at first, in large barracoons, or barrabakies, partly under ground, economizing in this way their limited supply of fire-wood, being dependent upon the sea for such drift-timber as might chance to lodge as the currents deflected from the Yonkon, and elsewhere, sweep around the Islands; but during the last twenty-five or thirty years they have all come into the general ownership and occupation of a hut to each family.

The Russian Fur Company, controlling the Islands, maintained on Saint Paul's and on Saint George, a store and an agent, the people supporting a priest and building a church upon each Island; and, living in this manner, they were brought into contact with the Americans at the time of the transfer of the Territory.

These people are therefore Christians, and, indeed, for that matter, all the Aleutians are, owing to the zealous and well-directed efforts of the Greek Catholic Church, aided by the Russian government. The fact that among all the savage races

THE VILLAGE OF ST. PAUL'S.

Seen from the east, looking over the killing grounds—October 10, 1872.

found on the northwest coast by Christian pioneers and teachers, the Aleutians are the only practical converts to Christianity, goes far in my thought to point and set them apart, as quite differently constituted by mind and disposition from our aborigines, to whom, however, they are most intimately related; they adopted the Christian faith with very little opposition, although, at the time of the first advent of the missionaries, they were practicing the most barbarous and heathenish customs and rites; but now, to all outward signs and professions of Christianity, they are as prompt and honest as our own church-going people. I am not to be understood, however, as saying that religion among these people is practiced as preached or professed.

How closely the Aleuts are allied to the Mongolians I cannot say, although I have no hesitation in stating that, from all points of personal bearing, intelligence and character, as well as physical structure, they seem to form a link of gradation between the Chinamen and our savages, the Esquimaux in particular; but they have no language, tradition, or anything in common with the Chinese or the natives of Japan.

To study this subject of Aleutian derivation properly, the inquirer on the Prybilov Islands has no fit opportunity, since the Aleut there is too much alloyed, though it may not be amiss to state that the nearer these people come to the pure Aleutian blood, the better they are as citizens and steady workingmen.

The only point upon which I would dwell with reference to the inhabitants of the Prybilov Islands is, that they are not *Indians* in our acceptation of the term, not any more so than are the lower classes who live in so much squalor and ignorance in all of our great cities and industrial centers.

These people are exceedingly thoughtless and improvident, shiftless and dirty, and all exist, even the best of them, as a matter of course, with one or two exceptions, in a state of profound ignorance.

As the services of their church are recited in Russian, and as most of the sub-priests, deacons, etc., are recruited from the ranks of the people themselves, the boys only being educated for this purpose, a large proportion of them speak and read the Russian imperfectly, though well enough to be understood in all ordinary conversation.

While with great difficulty, on Saint Paul's Island, five or six scholars for an American school there established were obtained during the winter and spring of 1872–'73 out of the forty or fifty younger ones and children then eligible, the Russian alphabet and church service was taught steadily during that time to fifteen or twenty of the boys and young men, by three or four of the elders, who, too, did not hesitate to use the rod.

It is not indisposition alone, on the part of the children and their parents, to attend the English school established by the Alaska Commercial Company on both Islands; the view expressed to the writer by one of the oldest and most intelligent of the people may be explanatory of their feeling and consequent action:

"I do not," said old Phillip Vollkov, "have any objection to the attendance of my children, nor have my neighbors

to that of theirs, on your (the English) school; but if our young men neglect their Russian lessons, who is going to take our places when we die, in our church, at our christenings and at our burials?" To any one familiar with the teachings of the Greek catholic church, the objection of Vollkov is right to the point, especially so with those to whom spiritual welfare on earth is superior to temporal wants. In the course of time, perhaps, the Russian church service may be translated and conducted in English for these people; but until that is accomplished, no satisfactory work can be done by an English school-teacher in educating them.

There are examples among the children as apt, quick and bright, as an average of our school-going youth; but the indifference or positive interference of their parents will not permit the progress of an English school to any noteworthy degree, at present.

The attendance at Saint George has been better, not by reason of public sentiment alone favoring, but is due entirely, such as it is, to the action of the assistant agent of the Treasury there, Mr. Samuel Falconer, who has taken some very good ground with the people in regard to the future of their children.

Everything is furnished gratis by the Alaska Commercial Company, such as warm, snug school-houses, books, paper, &c.

Up to the time of the transfer of the Territory the inhabitants all lived in huts, or sod-walled and dirt-roofed houses, barrabakies, partly underground, on Saint Paul's Island.

Most of these huts are damp, dark, and exceedingly filthy. Under the Russian *regime* the people had excuse for this squalor, but, as the case now stands, it is the improvidence and idleness of the inhabitants themselves if they are not comfortable; the use of seal-fat for fuel causes the appearance everywhere within doors of a thick deposit of greasy black soot, together with the strongest impregnation of a rank, mouldy, and indescribably offensive smell, for in earlier times they were obliged to burn blubber alone, having no other fuel at command, save the precarious supply of drift-wood that the ocean-currents might bring them; but now, by the terms of the lease, they are supplied with a sufficient quantity of coal to make them quite comfortable during the winter.

Since the Alaska Commercial Company have taken possession of the Islands the natives are being slowly but surely put into neat and habitable houses, and plenty of lumber distributed among those who have not as yet been removed, to patch up and make comfortable their old huts, and at the expiration of four or five more seasons the whole population of eighty odd families will be occupants of as many suitable houses, where they will be more healthy, and very much more useful, both to themselves in the present and their own best interests for the future. The example of the agents of the Alaska Commercial Company, who on both Islands maintain perfect order and neatness in their business and about their dwellings, store-houses, etc., is silent but most powerful, and the intercourse of these agents, who are gentlemen in every respect, with the people is always courteous, pleasant, and generous, giving these simple natives a quiet but steady elevation

THE GOVERNMENT HOUSE.

Residence of the Treasury Agents, St. Paul's Island—Built November 10, 1872.
(A similar house is on St. George.)

towards morality, sobriety, and industry, such as they never have had before; they were treated as so many animals by the Russians, and the conduct toward them of most of the United States revenue, marine, and military officers and men stationed here between the transfer of the Territory and the granting of the lease, cannot be characterized otherwise than disgraceful, their behavior being either a loafing, drunken, debauched, or quarrelsome example, and they soon succeeded in rendering the name *American* offensive to even these poor ignorant people.

But now a great change for the better within the short span of two years is strikingly apparent, and it is the more advanced on Saint George, due largely, however, to the personal force of character and industry of the assistant agent of the Treasury Department, who has co-operated with the agents of the Alaska Commercial Company in the most effective and wholesome manner.

The population of Saint Paul's Island is about two hundred and forty, men, women, and children, and of Saint George one hundred and twenty;[1] it has neither increased nor diminished for the last fifty years, but would have fallen off had recruits not been regularly drawn from the main-land and other Islands, the births on the Islands not being equal to the deaths; but in view of the great improvement in their condition, it may be reasonably anticipated that these people will at least hold their own, even though they do not increase to any noteworthy degree.

As to the especial fitness of these people for the labor connected with the sealing business, no comment is needed; nothing better in the way of manual service, skilled and rapid, could be rendered by any other body of men equal in number. They appear to shake off the periodic lethargy of winter, and rush with enthusiasm into the exercise and duty of capturing, killing, and skinning the seals. Very few outsiders can be found as good, for the work of skinning is exhausting to the novice, requiring long practice before the muscles of the back and thighs are sufficiently strong to enable a man to do a full day's work.

The manners and customs of these people possess in themselves nothing of a barbarous or striking character, as might be inferred from the condition of their Christianity. They are exceedingly polite and civil among themselves, and visit one with another freely and pleasantly, but very quietly indeed, for the topics of conversation are few, and judging from their silent but unconstrained meetings, they seem to have a mutual knowledge, as if by sympathy, of what may be running in each other's mind, rendering it quite superfluous to talk.

Living as they have so long under and with the Russians, they have adopted some of their customs, in the way of giving birth-day dinners, &c. They are great tea-drinkers, never using coffee. On account of the scarcity of fuel they seldom bake bread, purchasing from the store hard bread, soda and sweet crackers, in lieu thereof.

They are very prompt and punctual in all their relations with their church, which is especially adapted to them and

[1] "One hundred and twenty." Choris, Voyage Antour de Monde, 1822.

their wants; they long ago dropped the superstition of their heathenism, and have adopted as a better substitute, with the greatest unction, the pleasant myths of the Greek Catholic religion. The labors of the good priest, Venianinov, among these people, both on the Aleutian as well as these Islands, may be cited, perhaps, as the most successful work ever done among a savage people, with the noble object of improving its moral and physical condition. The ethnologist will find the perusal of his chapters on the natives of the Aleutian Islands to be of the utmost value, as they are the only records that point clearly to the habits and manners of a race who have entirely changed from their normal condition during the last century.

As a people they possess two very commendable traits in the composition of their character: first, they seldom ever, and then reluctantly, even when questioned, speak illy of any persons behind their backs; and secondly, they have a marked regard for the truth, although there are a number of backbiters and liars among them, well known, however, and justly without influence. I cannot speak very highly of their chastity or sobriety, although with regard to the former the women seldom sell themselves, incontinence is usually a matter of personal attraction or impulse, without the object of mercenary gain, greatly promoted by beer drinking. This, however, is not inexcusable altogether, for their slave-life under Russian rule crushed all pride or self-respect out of their being. The women, even up to the time of the transfer of the Territory were working in the field with the sealing-gangs of men, sharing equally in all the heaviest labor, and doing all the drudgery about the barrabakies; but the quiet example set before them by the agents of the Alaska Commercial Company in regard to this treatment of women, has, during the last two years, worked a perfect revolution in public sentiment there, and very few of the women now busy themselves outside of their motherly and household duties, the men growing less and less ashamed to bring water, pack wood, and carry meat from the killing-grounds.

As parents, they are most indulgent and affectionate while their children are in arms and under the age of eight or nine years, but when this age is attained by their offspring, they become toward them harsh disciplinarians and taskmasters, putting burdens heavy enough for mature shoulders upon youthful backs, always exacting implicit obedience.

The women are, as a class, prolific mothers, but are not fortunate in raising their children, for they are careless in regard to the great desiderata of air and diet, irregular at meals and sleeping, shiftless and unclean; and frequently while the babe is at the breast its mother will intoxicate herself with "quass," and poison the milk upon which the child is dependent. All these failings, together with a tardiness in announcing the presence of sickness in their families to the physicians, cause the speedy death of the great proportion of the children born upon these Islands.

Until the establishment of a physician upon each Island for their especial benefit, by the Alaska Commercial Company, they were dependent almost entirely upon themselves for aid and relief in the event of illness, believing largely in a mild form of Shamanish or laying on of hands, practiced usually by the old women, one of these quack doctoresses being in active demand still, even at the time of my residence there, 1872–'73, but the people are fast losing faith in the practice.

THE VILLAGE, ST. GEORGE'S ISLAND.

From the west—June 2, 1873.

A few of the families only have an inherent love of cleanliness, the members keeping both their persons and houses neat and tidy, but the general slovenly tone of the villages speaks eloquently of their improvident and shiftless disposition to the visitor, whoever he may be and whenever he may come.

But again to their credit let it be said, that they are uniformly quiet and civil in all their dealings with the agents of the Government and Company, rarely ever impertinent, and never fractious; never thrusting themselves in upon the notice of these gentlemen, without invitation to do so, when they are sober, and rarely even when drunk. They are keenly alive to humor, and very fond of good jokes, which they play upon one another constantly, having nicknames, &c., for every person in the community who may possess salient features of character or physiognomy.

The question will naturally be asked, What do these people do with themselves throughout the long idle fall, winter, and spring? and it may be answered, that they *vegetate* during most of this period. Some of the men are disagreeable exceptions, being enthusiastic gamblers, passing whole nights at their sittings, and even make no discrimination in favor of the sealing season, playing cards altogether, games taught them by the Russians and different persons who have been on the Islands since the transfer of the Territory; but the majority of them, men, women, and children, not having to make any exertion to obtain the necessaries of life, such as seal-meat, tea, hard bread, &c., sleep during the greater portion of the time not occupied in cooking and eating, and observance of the routine of the Greek Catholic Church. The latter alone preserves them from absolute stagnation; for in obedience to its teachings they attend quite regularly, make and receive calls on their saints' days, which are very numerous, and almost all these birth-days are enlivened by beer, which is brewed from flour, sugar, rice, &c., upon which they, men and women alike, become intoxicated to a greater or less degree. They also add to these entertainments of the "*eman-nim-ik*" very frequently the music of the accordeon, an instrument to which they are partial; a number of the women, in especial, can play, in an indifferent but tireless manner, a limited selection of airs, chiefly fragments of old songs and ballads, so popular once with us during the war, such as "Dixie," "John Brown," (a great favorite,) "Shoo fly," "Just before the battle, mother," &c., learned from the troops and different agents who have been stationed at the village; and from these parties they have also learned to dance, waltz, polka, schottische, quadrille, &c., which the older people, however, do not enjoy, and seldom indulge, unless under the influence of beer.

THE BEARING OF THE LEASING PRINCIPLE UPON THE ISLANDS.

After a careful and entirely impartial survey of the condition and working of affairs on the Seal Islands, during my residence there in 1872–'73, I can truly state that no legislation has ever done more to improve the condition of any people than the act of Congress has, which set aside the Prybilov Islands, and their inhabitants, from the Territory of Alaska, as a Government reservation, leasing them to the Alaska Commercial Company, July, 1871.

The truth of this will be evident to any one who contrasts the present condition of these people with what it was previous to the granting of the lease, and with that, also, of the people of their class who are now living upon the Aleutian Islands and the main land. The inquirer will learn that the people on these islands, now so universally well and comfortably clad, were, at the time of the transfer, so poor and illy provided for that they could not, in many instances, cover their nakedness; that they existed in absolute squalor under Russian rule, where they are now living in snug houses, such as our laboring classes occupy in the United States; and that the time is not far off when the whole population will be removed to comfortable frame houses from the damp dirt huts or *barrabakies;* that they earn and receive in coin, in less than two working months every year, *more* than the same number of our common working-men receive for a whole year's service;[1] and also that for all extra work, such as loading and unloading the company's vessels, building, grading, &c., these people are paid by the day from fifty cents to a dollar, according to the character of service rendered.

There is not the slightest attention given to, or interference made by the company (outside of its own work and the sealing interests) with, the private life and personal relations of the people among themselves; and let me here state, to the credit of these people, that the peaceful and harmonious manner in which they live together, during nine months at least every year, of idleness, would contrast very favorably with the lives of an equal number of our laboring classes, could they be brought suddenly up here and put on the same footing. I will only hint at the insubordination and worthlessness of such a community after six or eight months of torpidity and isolation.

It is true that the natives here have an inordinate predilection for spirituous and fermented liquor, and would destroy themselves were they not restrained in this propensity by the difficulty of obtaining this demoralizing beverage, and hence

[1] See Appendix.

THE EAST LANDING AND BLACK BLUFFS.

The beach covered with young Fur Seals—St. Paul's Island—October 10, 1872.

the importance of the act prohibiting the vending or manufacture of liquor in this Territory, and it should be rigorously enforced, under the severest penalties.

Regarded, therefore, from all points of view, the leasing of the Islands was an exceedingly judicious act of the Government, both with reference direct to its own pecuniary interests and the enhanced welfare of its new subjects.

Could affairs here be managed as they can be planned and placed on *paper*, then there is no argument in favor of a lease; the way would be clear for the Government *alone* to manage its property on these Islands, and triple or quadruple the present income derived; but it will at once be apparent to any impartial competent investigator, who may, and *must*, come upon the ground to form a correct opinion, that no other method than the one now in use is practicable, as long as the present rule is observed in regard to the appointment and removal of Government officers, for and from the supervision of these valuable and novel fisheries.

As matters now stand, the Government may have men appointed to these Islands who are entirely incompetent or dishonest, and unless some check like an agent of the present lessee was upon the field with them, they would do more injury in a few years of mismanagement than could be repaired, perhaps, in an ordinary lifetime of correct, judicious, and honest supervision on the part of their successors, who might, on the other hand, be capable and reliable men; but, in the present condition of affairs, the self-interest and heavy bonds of the lessee and its *risk* every season will keep experienced, able, and honest men in charge of its affairs. Its greatest and best interests are identically the same as those of the Government, *i. e.*, the preservation, and, if possible, the increase of the seal-life.

The frequent change of our public men in office who, like the Secretary of the Treasury, have the direction of a vast number of subordinates, will not guarantee any such close scrutiny similar to the course adopted by the Alaska Commercial Company, or any similar business firm having but one idea to serve, and the adoption of the leasing principle, therefore, is the only line of action that can be successfully carried out on the Seal Islands.

The novelty, importance, and value of the sealing-interests on the Pribilov Islands, unparalleled on the face of the globe at the present time, fully justified the Senators and Representatives of the United States in legislating for them as they have, thus securing for the future the preservation, at least, of these valuable interests in their original integrity.

THE SEAL-LIFE ON THE PRYBILOV ISLANDS

May be classed under four heads, as follows, viz:

The Fur-Seal, *Callorhinus ursinus*, (Kautickee of the Russians.)
The Sea-Lion, *Eumetopias stellerii*, (Sea vitchee of the Russians.)
The Hair-Seal, *Phoca vitulina*, (Nearhpah of the Russians.)
The Walrus, *Rosmarus*, (Morsjee of the Russians.)

Of the above, the hair-seal is the animal upon which popular and, indeed, scientific opinion is founded as to what a seal appears like, and has in this way given to the people a false idea of its relatives, above enumerated, and has made it exceedingly difficult for the naturalist to correctly discriminate between them; for, although it belongs to the same family, it does not even have a generic affinity to those seals with which it has been persistently confounded, viz, the fur-seal and sea-lion, no more so than has the raccoon to the black or grizzly bear, both being as nearly related to each other.

A detailed description of this seal, *Phoca vitulina*, is quite unnecessary, as species of the genus are common pets all over the world where zoölogical gardens are established, and its grotesquely stuffed skin is still more frequently to be met with.

It differs, however, so completely in shape and habit from its congeners on these islands, that it may be well, so as to preserve a sharp line of distinction, to state that it seldom comes up from the water more than a few rods, at the most, generally resting at the margin of the surf-wash; it takes up no position on land to hold and protect a harem, preferring the detached water-worn rocks which occasionally project out a little above the sea-level and are only wet entirely over by heavy storms; and the animal when it is disturbed immediately goes to sea. Upon these small spots of rocky, wet isolation from the main island, and some secluded places on the north shore, the "nearhpah," as the natives call it, brings forth its young, which is a single pup, perfectly white, weighing about three or four pounds. This pup grows rapidly, and weighs, in three to four months, forty and fifty pounds, and at that time has a coat of soft, steel-gray hair on the head, limbs, and abdomen, with the back most richly mottled and barred lengthwise with dark-brown and brown-black. When they appear

"Polavina Sopka" and "Big Lake."

From the Sand-dume Tract, north shore, St. Paul's Island—Natives herding Sea-lions—November 20, 1872.

in the spring, following, this gray tone to their color has become a dingy ochre, and the mottling appears well over the head and on the upper side or back of the flippers, or feet, correspondingly dim.

There is no appreciable difference as to color or size between the sexes.

They are not polygamous, as far as I have observed.

They are exceedingly timid and wary at all times, and in this way they are diametrically opposed, not by shape alone, but by habit and disposition, to the fur-seal and sea-lion.

Their skin is of little value compared with that of the fur-seal, and their chief merit is the relative greater juiciness and sweetness of their flesh to those who are in any way partial to seal-meat.

I desire also to correct a common error, made in comparing *Phocidæ* with *Otaridæ*, where it is stated that, in consequence of the peculiar structure of their limbs, their progression on land is "*mainly accomplished* by a wriggling, serpentine motion of the body, slightly assisted by the extremities." This is not so; for, when excited to run or exert themselves to reach the water suddenly, they strike out quickly with *both fore feet*, simultaneously lift and drag the whole body, without any wriggling whatever, from 6 inches to a foot ahead and slightly from the earth, according to the violence of the effort and the character of the ground; the body then falls flat, and the fore-flippers are free for another similar action, and this is done so earnestly and rapidly that in attempting to head off a young nearhpah from the water I was obliged to leave a brisk walk and take to a dog-trot to do it. The hind feet are not used when exerted in rapid movement at all, and are dragged along in the wake of the body, perfectly limp. They do use their posterior parts, however, when leisurely climbing up and over rocks, or playing one with another, but it is always a weak effort, and clumsy. These remarks of mine, it should be borne in mind, apply only to the *Phoca vitulina*, that is found around these Islands at all seasons of the year, but in very small numbers. I have never seen more than twenty-five or thirty at any one time, but I think its principle of locomotion will be found to apply on land to all the rest of its class.

THE FUR-SEAL, (CALLORHINUS URSINUS,)

Which repairs to these Islands to breed, &c., in numbers that seem almost fabulous, is by far the highest organized of all the PINNIPEDIA, and, indeed, for that matter, when land and water are fully taken into account, there is no other animal superior to it from a purely physical point of view; and few creatures that can be said to exhibit a higher order of instinct, approaching even intelligence, belonging to the animal kingdom.

Regarding a male six to seven years old, and full grown, when he comes up from the sea in the spring on to his station for the breeding season, we have an animal that will measure $6\frac{1}{2}$ to $7\frac{1}{2}$ feet in length, from tip of nose to end of tail, and weighing at least 400 pounds, and sometimes as much, perhaps, as 600. (?) The head, which in comparison with the immense thick neck and shoulders, seems to be disproportionately small; but as we come to examine it we will find that it is mostly all occupied by the brain; the light frame-work of the skull supports an expressive pair of large bluish hazel eyes, and a muzzle and jaws of nearly the same size and form, observed in any full-blooded Newfoundland dog, with the difference of having no flabby, hanging lips; the upper lips support a white and yellowish-gray moustache, long, and, when not torn in combat, luxuriant, composed of heavy stiff bristles.

Observe him as he comes leisurely swimming on toward the land; how high above the water he carries his head, and how deliberately he surveys the beach, after he has *stepped* up on to it; he may be truly said to step with his fore-flippers, for they regularly alternate as he moves up, carrying his head well above them, at least three feet from the ground, with a perfectly erect neck.

His fore-feet, or hands, are, as you can see, a pair of dark bluish-black flippers, about 8 or 10 inches broad at their junction with the body, running out to an ovate point some 15 to 18 inches from this union, which is at the carpal-joint, corresponding to our wrist; all the rest of the fore-arm, the ulna, radius, and humerus, being concealed under the skin and thick blubber folds of the main body and neck, concealed entirely at this season when he is so fat, but later, when flesh or fat has been consumed by absorption, they come into quite plain view.

On the upper side of these flippers, the hair straggles down finer and fainter, as it comes down to a point close to and slightly beyond where the phalanges and the metacarpal-bones are jointed, similar to the spot where our knuckles are

placed, and there ends, leaving the skin bare and wrinkled in places at the margin of the inner side, showing five small pits containing abortive nails, which are situated right over the union of the phalanges with their cartilagineous continuations to the end of the flipper.

On the under side of the flipper the skin is entirely bare from the end, up to the body connection, deeply and regularly wrinkled with seams and furrows, which cross one another, so as to leave a kind of sharp diamond-pattern.

But we observe, as he moves along, that, though he handles his fore-limbs in a most creditable manner, he brings up his rear in quite a different style; for after every second step ahead with the fore-feet he arches up his spine, and with it drags and lifts together his hinder limbs to a fit position under his body for another movement forward, by which the spine is again straightened out so as to take a fresh hitch up on the posteriors. This is his leisurely and natural movement on land when not disturbed, the body being carried clear of the ground.

The radical difference in the form and action of his hinder feet cannot fail to strike the eye at once. They are one-seventh longer and very much lighter, and more slender; they, too, are merged in the body like those anterior; nothing can be seen of the leg above the tarsal-joint.

The shape of this hind-flipper is strikingly like a human foot, provided the latter were drawn out to a length of 20 or 22 inches, the instep flattened down and the toes run out into thin, membraneous, oval-tipped points, only skin-thick, leaving three strong cylindrical grayish horn-colored nails, half an inch long, back six inches from these skinny toe-ends, without any nails to mention on the big and little toes.

On the upper side of this foot the hair comes down to the point where the metatarsus and phalangial bones joint, and fades out; from this junction the phalanges, about six inches down to the nails, are entirely bare and stand ribbed up in bold relief on the membrane which unites them as a web; the nails mark the ends of the phalangial bones and their union in turn with the cartilagineous processes, which run rapidly tapering and flattening, out to the ends of the thin toe-flaps.

Now, as we look at this fur-seal's progression, that which seems most odd is the gingerly manner (if I may be allowed to use the expression) in which he carries these hind-flippers; they are held out at right angles from the body directly opposite the pelvis, the toe-ends and flaps slightly waving and curling or drooping over, supported daintily, as it were, above the earth, only suffering his weight behind to fall upon the heels, which are opposed to each other scarcely five inches apart.

We shall, as we see him again later in the season, have to notice a different mode of progression, both when lording it over his harem or when he grows shy and restless at the end of the breeding-season, and now proceed to notice him in the order of his arrival and that of his family, his behavior during the long period of fasting and unceasing activity and vigilance and other cares which devolve upon him, as the most eminent of all polygamists in the brute world; and to fully

comprehend this exceedingly interesting animal, it will be necessary to refer to my drawings and paintings made from it and its haunts.

The adult males are first to arrive in the spring on the ground deserted by all classes last year.

Between the 1st and 5th of May, usually, a few bulls will be found scattered over the rookeries pretty close to the water. They are at this time quite shy and sensitive, not yet being satisfied with the land, and a great many spend day after day before coming ashore idly swimming out among the breakers a little distance from the land, to which they seem somewhat reluctant at first to repair. These first arrivals are not always the oldest bulls, but may be said to be the finest and most ambitious of their class; they are full-grown and able to hold their stations on the rocks, which they immediately take up after coming ashore.

I am not able to say authoritatively that these animals come back and take up the same position on the breeding-grounds occupied by them during the preceding season; from my knowledge of their action and habit, and from what I have learned of the natives, I should say that very few, if any of them, make such a selection and keep these places year after year. One old bull was pointed out to me on the Reef-Garbutch Rookery as being known to the natives as a regular visitor at, close by, or on the same rock every season during the past three years, but he failed to reappear on the fourth; but if these animals came each to a certain place and occupied it regularly, season after season, I think the natives here would know it definitely; as it is, they do not. I think it very likely, however, that the older bulls come back to the same rookery-ground where they spent the previous season, but take up their positions on it just as the circumstances attending their arrival will permit, such as fighting other seals which have arrived before them, &c.

With the object of testing this matter, the Russians, during the early part of their possession, cut off the ears from a given number of young male seals driven up for that purpose from one of the rookeries, and the result was that cropped seals were found on nearly all the different rookeries or "hauling-grounds" on the Islands after. The same experiment was made by Captain Bryant two years ago, who had the left ears taken off from a hundred young males which were found on Lukannon Rookery, Saint Paul's Island; of these the natives last year found two on Novastosh-nah Rookery, ten miles north of Lukannon, and two or three from English Bay and Tolstoi Rookery, six miles west by water; one or two were taken on Saint George's Island, thirty-six miles to the southeast, and not one from Lukannon was found among those that were driven from there; and, probably, had all the young males on the two Islands been driven up and examined, the rest would have been found distributed quite equally all around, although the natives say that they think the cutting off of the animal's ear gives the water such access to its head as to cause its death; this, however, I think requires confirmation. These experiments would tend to prove that when the seals approach the Islands in the spring, they have nothing but a general instinctive appreciation of the fitness of the land as a *whole*, and no especial fondness for any *particular spot*.

The landing of the seals upon the respective rookeries is influenced greatly by the direction of the wind at the time of

THE INTERIOR OF LUKAH'S BARRABAKIE.

Native's House, St. Paul's Village—July 28, 1873.

approach to the Islands. The prevailing winds, coming from the northeast, north, and northwest, carry far out to sea the odor or scent of the pioneer bulls, which have located themselves on different breeding-grounds three or four weeks usually in advance of the masses; and hence it will be seen that the rookeries on the south and southeastern shores of Saint Paul's Island receive nearly all the seal-life, although there are miles of eligible ground on the north shore.

To settle this question, however, is an exceedingly difficult matter; for the identification of individuals, from one season to another, among the hundreds of thousands, and even millions, that come under the eye on a single one of these great rookeries, is really impossible.

From the time of the first arrivals in May up to the 1st of June, or as late as the middle of this month, if the weather be clear, is an interval in which everything seems quiet; very few seals are added to the pioneers. By the 1st of June, however, or thereabouts, the foggy, humid weather of summer sets in, and with it the bull-seals come up by hundreds and thousands, and locate themselves in advantageous positions for the reception of the females, which are generally three weeks or a month later, as a rule.

The labor of locating and maintaining a position in the rookery is really a serious business for those bulls which come in last, and for those that occupy the water-line, frequently resulting in death from severe wounds in combat sustained.

It appears to be a well-understood principle among the able-bodied bulls that each one shall remain undisturbed on his ground, which is usually about 10 feet square, provided he is strong enough to hold it against all comers; for the crowding in of fresh bulls often causes the removal of many of those who, though equally able-bodied at first, have exhausted themselves by fighting earlier, and are driven by the fresher animals back farther and higher up on the rookery.

Some of these bulls show wonderful strength and courage. I have marked one veteran, who was among the first to take up his position, and that one on the water-line, where at least fifty or sixty desperate battles were fought victoriously by him with nearly as many different seals, who coveted his position, and when the fighting season was over, (after the cows have mostly all hauled up,) I saw him, covered with scars and gashes raw and bloody, an eye gouged out, but lording it bravely over his harem of fifteen or twenty cows, all huddled together on the same spot he had first chosen.

The fighting is mostly or entirely done with the mouth, the opponents seizing each other with the teeth and clenching the jaws; nothing but sheer strength can shake them loose, and that effort most always leaves an ugly wound, the sharp incisors tearing out deep gutters in the skin and blubber or shredding the flippers into ribbon-strips.

They usually approach each other with averted heads and a great many false passes before either one or the other takes the initiative by griping; the head is darted out and back as quick as flash, their hoarse roaring and shrill-piping whistle never ceasing, their fat bodies writhing and swelling with exertion and rage, fur flying in air and blood streaming down—all combined, make a picture fierce and savage enough, and, from its great novelty, exceedingly strange at first sight.

In these battles the parties are always distinct, the offensive and the defensive; if the latter proves the weaker he with

draws from the position occupied, and is never followed by his conqueror, who complacently throws up one of his hind flippers, fans himself as it were, to cool himself from the heat of the conflict, utters a peculiar chuckle of satisfaction or contempt, with a sharp eye open for the next covetous bull or "see-catch."[1]

The period occupied by the males in taking and holding their positions on the rookery, offers a favorable opportunity in which to study them in the thousand and one different attitudes and postures assumed between the two extremes of desperate conflict and deep sleep—sleep so sound that one can, by keeping to the leeward, approach close enough, stepping softly, to pull the whiskers of any one taking a nap on a clear place; but after the first touch to these whiskers the trifler must jump back with great celerity if he has any regard for the sharp teeth and tremendous shaking which will surely overtake him if he does not.

The neck, chest, and shoulders of a fur-seal bull comprise more than two-thirds of his whole weight; and in this long thick neck and fore limbs is embodied the larger portion of his strength; when on land, with the fore-feet he does all climbing over rocks, over the grassy hummocks back of the rookery, the hind-flippers being gathered up after every second step forward, as described in the manner of walking; these fore-feet are the propelling power when in water, almost exclusively, the hinder ones being used as rudders chiefly.

The covering to the body is composed of two coats, one being of short, crisp, glistening over-hair, and the other a close, soft elastic pelage, or fur, which gives distinctive value to the pelt.

At this season of first "hauling up" in the spring, the prevailing color of the bulls after they dry off and have been exposed to the weather is a dark, dull brown, with a sprinkling of lighter brown black, and a number of hoary or frosted-gray coats; on the shoulders the over-hair is either a gray or rufous-ochre, called the "wig;" these colors are most intense upon the back of the head, neck and spine, being lighter underneath. The skin of the muzzle and flippers, a dark bluish-black, fading to a reddish and purplish tint in some. The ears and tail are also similar in tint to the body, being in the case of the former a trifle lighter; the ears on a bull fur-seal are from an inch to an inch and a half in length; the *pavilions* tightly rolled up on themselves so that they are similar in shape and size to the little finger on the human hand, cut off at the second (phalangial) joint, a shade more cone-shaped, for they are greater in diameter at the base than at the tip.

I think it probable that the animal has and exerts the power of compressing or dilating this scroll-like *pavilion* to its ear, accordingly as it dives deep or rises in the water; and also, I am quite sure that the hair-seal has this control over the *meatus externus*, from what I have seen of it; but I have not been able to verify it in either case by observation; but such opportunity as I have had, gives me undoubted proof of the greatest keenness in hearing; for it is impossible to approach one, even when sound asleep; if you make any noise, frequently no matter how slight, the alarm will be given instantly by

[1] "See-catch," native name for the bulls on the rookeries, especially those which are able to maintain their position.

NATIVE BOAT, OR "BIDARRAH."

Made out of Sea-lion skins stretched over a wooden frame—Village cove, St. Paul's Island.

the insignificant looking auditors, and the animal, rising up with a single motion erect, gives you a stare of astonishment, and at this season, of defiance, together with incessant surly roaring, growling, and "spitting."

This spitting, as I call it, is by no means a fair or full expression of the most characteristic sound and action, peculiar, so far as I have observed, to the fur-seals, the bulls in particular. It is the usual prelude to their combats, and follows somewhat in this way—when the two disputants are nearly within reaching or striking distance, they make a number of feints or false passes at one another, with the mouth wide open and lifting the lips or snarling, so as to exhibit the glistening teeth, and with each pass they expel the air so violently through the larynx as to make a rapid CHOO-CHOO-CHOO sound, like the steam-puffs in the smoke-stack of a locomotive when it starts a heavy train, and especially when the driving-wheels slip on the rail.

All the bulls now have the power and frequent inclination to utter four entirely distinct calls or notes—a hoarse, resonant roar, loud and long; a low gurgling growl; a chuckling, sybilant, piping whistle, of which it is impossible to convey an adequate idea, for it must be heard to be understood; and this spitting, just described. The cows[1] have but one note—a hollow, prolonged, *bla-a-ting* call, addressed only to their pups; on all other occasions they are usually silent. It is something like the cry of a calf or sheep. They also make a spitting sound, and snort, when suddenly disturbed. The pups "*bla-at*" also, with little or no variation, the sound being somewhat weaker and hoarser than that of their mothers for the first two or three weeks after birth; they, too, spit and cough when aroused suddenly from a nap or driven into a corner. A number of pups crying at a short distance off bring to mind very strongly the idea of a flock of sheep "*baa-aa-ing.*"

Indeed, so similar is the sound that a number of sheep brought up from San Francisco to Saint George's Island during the summer of 1873 were constantly attracted to the rookeries, running in among the seals, and requiring to be driven away to a good feeding-ground by a small boy detailed for the purpose.

The sound arising from these great breeding-grounds of the fur-seal, where thousands upon thousands of angry, vigilant bulls are roaring, chuckling, piping, and multitudes of seal-mothers are calling in hollow, bla-ating tones to their young, which in turn respond incessantly, is simply indescribable. It is, at a slight distance, softened into a deep booming, as of a cataract, and can be heard a long ways off at sea, under favorable circumstances as far as five or six miles, and frequently warns vessels that may be approaching the Islands in thick, foggy weather of the positive, though unseen, proximity of land. Night and day, throughout the season, the din of the rookeries is steady and constant.

[1] Without explanation I may be considered as making use of misapplied terms in describing these animals, for the inconsistency of coupling "pups" with "cows" and "bulls" and "rookeries" with the breeding-grounds of the same, cannot fail to be noticed; but this nomenclature has been given and used by the English and American whalemen and sealing parties for many years, and the characteristic features of the seals suit the odd naming exactly, so much so that I have felt satisfied to retain the style throughout as rendering my description more intelligible, especially so to those who are engaged in the business or may be hereafter. The Russians are more consistent, but not so "pat." The bull is called "see-catch," a term implying strength, vigor, &c.; the cow, "matkah," or mother; the pups, "kotickie," or little seals; the non-breeding males, under six and seven years, "hollus-chickie," or batchelors. The name applied collectively to the fur-seal by them is "morskie-kot," or sea-cats.

The seals seem to suffer great inconvenience from a comparatively low degree of heat; for, with a temperature of 46° and 48° on land, during the summer, they show signs of distress from heat whenever they make any exertion, pant, raise their hind flippers, and use them incessantly as fans. With the thermometer at 55°–60°, they seem to suffer even when at rest, and at such times the eye is struck by the kaleidoscopic appearance of a rookery, on which a million seals are spread out in every imaginable position their bodies can assume, all industriously fanning themselves, using sometimes the fore flippers as ventilators, as it were, by holding them aloft motionless, at the same moment fanning rbiskly with the hind flipper, or flippers, according as they sit or lie. This wavy motion of flapping and fanning gives a peculiar shade of hazy indistinctness to the whole scene, which is difficult to express in language; but one of the most prominent characteristics of the fur-seal is this fanning manner in which they use their flippers, when seen on the breeding-grounds in season. They also, when idling, as it were, off shore at sea, lie on their sides, with only a partial exposure of the body, the head submerged, and hoist up a fore or hind flipper clear of the water, while scratching themselves or enjoying a nap; but in this position there is no fanning. I say "scratching," because the seal, in common with all animals, is preyed upon by vermin, a species of louse and a tick, peculiar to itself.

All the bulls, from the very first, that have been able to hold their positions, have not left them for an instant, night or day, nor do they do so until the end of the rutting-season, which subsides entirely between the 1st and 10th of August, beginning shortly after the coming of the cows in June. Of necessity, therefore, this causes them to fast, to abstain entirely from food of any kind, or water, for three months, at least, and a few of them stay four months before going into the water for the first time after hauling up in May.

This alone is remarkable enough, but it is simply wonderful when we come to associate the condition with the unceasing activity, restlessness, and duty devolved upon the bulls as heads and fathers of large families. They do not stagnate, like bears in caves; it is evidently accomplished or due to the absorption of their own fat, with which they are so liberally supplied, when they take their positions on the breeding-ground, and which gradually diminishes while they remain on it. But still some most remarkable provision must be made for the entire torpidity of the stomach and bowels, consequent upon their being empty and unsupplied during this long period, which, however, in spite of the violation of a supposed physiological law, does not seem to affect them, for they come back just as sleek, fat, and ambitious as ever, in the following season.

I have examined the stomachs of a number which were driven up and killed immediately after their arrival in the spring, and natives here have seen hundreds, even thousands, of them during the killing-season in June and July, but in no case has anything been found other than the bile and ordinary secretions of healthy organs of this class, with the exception only of finding in *every* one a snarl or cluster of worms,[1] from the size of a walnut to that of one's fist, the fast apparently having

[1] Nematoda.

THE NORTH SHORE OF ST. PAUL'S ISLAND.

Looking west from the summit of Cross Hill, on N. E. Point—July 26, 1872.

no effect on them, for when three or four hundred old bulls were slaughtered late in the fall, to supply the natives with bidarkee, or canoe-skins, I found these worms in a lively condition in every paunch cut open, and their presence, I think, gives some reason for the habit which these old bulls have of swallowing small boulders, the stones in some of the stomachs weighing half a pound or so, and in one paunch I found about five pounds in the aggregate of larger pebbles, which in grinding against one another must destroy, in a great measure, these intestinal pests. The sea-lion is also troubled in the same way by a similar species of worm, and I have preserved a stomach of one of these animals in which are more than ten pounds of boulders, some of them alone quite large. The greater size of this animal enables it to swallow stones which weigh two and three pounds. I can ascribe no other cause for this habit among these animals than that given, as they are of the highest type of the carnivora, eating fish as a regular means of subsistence; varying the monotony of this diet with occasional juicy fronds of sea-weed, or kelp, and perhaps a crab, or such, once in a while, provided it is small and tender, or soft-shelled.

Between the 12th and 14th of June the first of the cow-seals come up from the sea, and the bulls signalize it by a universal, spasmodic, desperate fighting among themselves.

The strong contrast between the males and females in size and shape is heightened by the air of exceeding peace and amiability which the latter class exhibit.

The cows are from 4 to 4½ feet in length from head to tail, and much more shapely in their proportions than the bulls, the neck and shoulders being not near so fat and heavy in proportion to the posteriors.

When they come up, wet and dripping, they are of a dull, dirty gray color, darker on the back and upper parts, but in a few hours the transformation made by drying is wonderful; you would hardly believe they could be the same animals, for they now fairly glisten with a rich steel and maltese-gray luster on the back of the head, neck, and spine, which blends into an almost pure white on the chest and abdomen. But this beautiful coloring in turn is altered by exposure to the weather, for in two or three days it will gradually change to a dull, rufous ocher below, and a cinereous-brown and gray-mixed above; this color they retain throughout the breeding-season up to the time of shedding the coat in August.

The head and eye of the female is really attractive; the expression is exceedingly gentle and intelligent; the large, lustrous eyes, in the small, well-formed head, apparently gleam with benignity and satisfaction when she is perched up on some convenient rock and has an opportunity to quietly fan herself.

The cows appear to be driven on to the rookeries by an accurate instinctive appreciation of the time in which their period of gestation ends; for in all cases marked by myself, the pups are born soon after landing, some in a few hours after, but most usually a day or two elapses before delivery.

They are noticed and received by the bulls on the water-line stations, with every attention; they are alternately

coaxed and urged up on to the rocks, and are immediately under the most jealous supervision; but owing to the covetous and ambitious nature of the bulls, which occupy the stations reaching way back from the water-line, the little cows have a rough-and-tumble time of it, when they begin to arrive in small numbers at first; for no sooner is the pretty animal fairly established on the station of bull number one, who has installed her there, he perhaps sees another one of her style down in the water where she has just come from, and in obedience to his polygamous feeling, he devotes himself anew to coaxing the later arrival in the same winning manner, so successful in her case, when bull number two, seeing bull number one off his guard, reaches out with his long strong neck and picks the unhappy but passive creature up by the scruff of hers, just as a cat does a kitten, and deposits her on his seraglio ground; then bulls number three, four, and so on, in the vicinity, seeing this high-handed operation, all pitch into one another, and especially into bull number two, and have a tremendous fight, perhaps for a half a minute or so, and during this commotion the cow generally is moved or moves farther back from the water, two or three stations more, where, when all gets quiet, she usually remains in peace, her last lord and master not having the exposure to such diverting temptation as had her first, he gives her such care that she not only is unable to leave did she wish to, but no other bull can seize upon her. This is only one instance of the many different trials and tribulations which both parties on the rookery subject themselves to before the harems are filled. Way back, fifteen or twenty stations deep from the water-line sometimes, but generally not more on an average than ten or fifteen, the cows crowd in at the close of the season for arriving, July 10 to 14, and then they are able to go about pretty much as they please, for the bulls have become greatly enfeebled by this constant fighting and excitement during the past two months, and are quite content with even only one or two partners.

The cows seem to haul in compact bodies from the water up to the rear of the rookeries, never scattering about over the ground; and they will not lay quiet in any position outside of the great mass of their kind. This is due to their intensely gregarious nature, and for the sake of protection. They also select land with special reference to the drainage, having a great dislike to water-puddled ground. This is well shown on Saint Paul.

I have found it difficult to ascertain the average of cows to one bull on the rookery, but I think it will be nearly correct to assign to each male from twelve to fifteen females, occupying the stations nearest the water, and those back in the rear from five to nine. I have counted forty-five cows all under the charge of one bull, who had them penned up on a flat table-rock, near *Kee-tavee Point;* the bull was enabled to do this quite easily, as there was but one way to go to or come from this seraglio, and on this path the old Turk took his stand and guarded it well.

At the rear of all these rookeries there is always a large number of able-bodied bulls, who wait patiently, but in vain, for families, most of them having had to fight as desperately for the privilege of being there as any of their more fortunately-located neighbors, who are nearer the water than themselves; but the cows do not like to be in any outside position, where they are

LUKANNON BEACH.

Sand-dune Tracts, east shore of St. Paul's Island—Fur Seals playing in the surf—June 25, 1872.

not in close company, lying most quiet and content in the largest harems, and these large families pack the surface of the ground so thickly that there is hardly moving or turning room until the females cease to come up from the sea; but the inaction on the part of the bulls in the rear during the rutting-season, only serves to qualify them to move into the places vacated by those males who are obliged to leave from exhaustion, and to take the positions of jealous and fearless protectors for the young pups in the fall.

The courage with which the fur-seal holds his position, as the head and guardian of a family, is of the very highest order, compared with that of other animals. I have repeatedly tried to drive them when they have fairly established themselves, and have almost always failed, using every stone at my command, making all the noise I could, and, finally, to put their courage to the full test, I walked up to within 20 feet of a bull at the rear and extreme end of Tolstoi Rookery, who had four cows in charge, and commenced with my double-barrelled breech-loading shot-gun to pepper him all over with mustard-seed or dust-shot. His bearing, in spite of the noise, smell of powder, and pain, did not change in the least from the usual attitude of determined defensive which most all the bulls assume when attacked with showers of stones and noise; he would dart out right and left and catch the cows, which timidly attempted to run, after each report, and fling and drag them back to their places; then, stretching up to his full height, look me directly and defiantly in the face, roaring and spitting most vehemently. The cows, however, soon got away from him; but he still stood his ground, making little charges on me of 10 or 15 feet in a succession of gallops or lunges, spitting furiously, and then retreating to the old position, back of which he would not go, fully resolved to hold his own or die in the attempt.

This courage is all the more noteworthy from the fact that, in regard to man, it is invariably of a defensive character. The seal, if it makes you turn when you attack it, never follows you much farther than the boundary of its station, and no aggravation will compel it to become offensive, as far as I have been able to observe.

The cows, during the whole season, do great credit to their amiable expression by their manner and behavior on the rookery; never fight or quarrel one with another, and never, or seldom, utter a cry of pain or rage when they are roughly handled by the bulls, who frequently get a cow between them and tear the skin from her back, cutting deep gashes into it, as they snatch her from mouth to mouth. These wounds, however, heal rapidly, and exhibit no traces the next year.

The cows, like the bulls, vary much in weight. Two were taken from the rookery nearest Saint Paul's Village, after they had been delivered of their young, and the respective weights were 56 and 101 pounds, the former being about three or four years old, and the latter, over six. They both were fat and in excellent condition.

It is quite out of the question to give a fair idea of the positions in which the seals rest when up on land. They may be said to assume every possible attitude which a flexible body can be put into. One favorite position, especially with the cows, is to perch upon a point or top of some rock and throw their heads back upon the shoulders, with the nose held aloft, then, closing their eyes, take short naps without changing, now and then gently fanning with one or the other of the long

slender hind flippers; another, and the most common, is to curl themselves up, just as a dog does on a hearth-rug, bringing the tail and the nose close together. They also stretch out, laying the head straight with the body, and sleep for an hour or two without moving, holding one of the hinder flippers up all the time, now and then gently waving it, the eyes being tightly closed.

The sleep of the fur-seal, from the old bull to the young pup, is always accompanied by a nervous muscular twitching and slight shifting of the flippers; quivering and uneasy rolling of the body, accompanied by a quick folding anew of the fore flippers, which are signs, as it were, of their having nightmares, or sporting, perhaps, in a visionary way, far off in some dream-land sea; or disturbed, perhaps more truthfully, by their intestinal parasites. I have studied hundreds of all classes, stealing softly up so close that I could lay my hand on them, and have always found the sleep to be of this nervous description. The respiration is short and rapid, but with no breathing (unless your ear is brought very close) or snoring sound; the heaving of the flanks only indicates the action. I have frequently thought that I had succeeded in finding a snoring seal, especially among the pups, but a close examination always gave some abnormal reason for it, generally a slight distemper, by which the nostrils were stopped up to a greater or less degree.

As I have said before, the cows, soon after landing, are delivered of their young. The period of labor in forty or fifty cases which were closely watched and timed by myself, was from three to ten minutes. The head presented first in all, and the placental membrane ruptured with expulsion, letting the new-born seal drop upon the rocks, with hardly any voiding of blood or other fluids which are more or less profuse in most animals. The cow, previous to labor, usually extends herself flat upon her chest and abdomen, alternately raising and lowering her head and shoulders during the labor-pains, which do not seem to be at all violent; the only sign given, if she does suffer, is a short panting, which is very faint and can scarcely be heard; the hind flippers are held out horizontally, and kept in a constant pumping motion, as it were.

As soon as the pup is dropped, (twins are rare, if ever,) it finds its voice, a weak, husky *blaat*, and begins to paddle about, with eyes wide open, in a confused sort of way for a few minutes until the mother is ready to give it attention, and, still later, suckle it; and for this purpose she is provided with four small, brown nipples, placed about eight inches apart, lengthwise with the body, on the abdomen, between the fore and hinder flippers, with some four inches of space between them transversely. The nipples are not usually visible; only seen through the hair and fur when the cow puts herself in position for the pup to nurse, by which action she exposes the abdomen, showing, however, no udder-folds or traces. The milk is abundant, rich, and creamy. The pups nurse very heartily, gorging themselves.

The pup when born, and for the next three months, is of a jet-black color, hair, eyes, and flippers, save a tiny white patch just back of each fore-foot, and weighs from three to four pounds, and 12 to 14 inches long; it does not seem to nurse more than once every two or three days, but in this I am most likely mistaken, for they may have received attention from the mother in the night or other times in the day when I was unable to watch them.

THE HAIR SEAL, OR "NEARHPAH."

Young 2 weeks old—Adult.

The apathy with which the young are treated by the old on the breeding-grounds, is somewhat strange. I have never seen a cow caress or fondle her offspring, and should it stray but a short distance from the harem, it can be picked up and killed before the mother's eyes without causing her to show the slightest concern. The same indifference is exhibited by the bull to all that takes place outside of the boundary of his seraglio. While the pups are, however, within the limits of his harem-ground, he is a jealous and fearless protector; but if the little animals pass beyond this boundary, then they may be picked up and carried off without the slightest attention in their behalf from their guardian.

It is surprising to me how few of the pups get crushed to death while the ponderous bulls are floundering over them when engaged in fighting. I have seen two bulls dash at each other with all the energy of furious rage, meeting right in the midst of a small "pod" of forty or fifty pups, trampling over them with their crushing weights and bowling them out right and left in every direction, without injuring a single one. I do not think more than one per cent. of the pups born each season are lost in this manner on the rookeries.

To test the vitality of these little animals, I kept one in the house to ascertain how long it could live without nursing, having taken it immediately after birth and before it could get any taste of its mother's milk; it lived nine days, and in the whole time half of every day was spent in floundering about over the floor, accompanying the movement with a persistent hoarse *blaating*. This experiment certainly shows wonderful vitality, and is worthy of an animal that can live four months without food or water and preserve enough of its latent strength and vigor, at the end of that time, to go far off to sea and return as fat and hearty as ever, during the next season.

In the pup, the head is the only disproportionate feature when it is compared with the proportion of the adult form, the neck being also relatively shorter and thicker. I shall have to speak again of it, as it grows and changes, when I finish with the breeding-season now under consideration.

Soon after the birth of their young the cows pass into "heat," and by the 13th and 15th of July the rutting-season is at its height, or, I should say, the greatest number of cows are in condition, and this period subsides almost entirely by the end of July and as early as the 5th of August.

The female is, after a little preliminary coaxing, (generally on her part first later in the season,) covered by the male precisely as a small terrier slut is by a big Newfoundland dog, and the time of actual coition varies from one to fourteen minutes, accordingly as they are undisturbed by their fellows and the freshness of the bull; the majority of cases occupy from eight to ten minutes. The action is exceedingly earnest and violent, without much more than a few seconds between the orgasms, and it is on this account, mainly, that I feel justified in differing with those who have written before with considerable stress on this feature, by saying that, since it requires the whole great weight of the bull to hold the cow, which is perfectly passive, in a fixed position during the violent connection, it is impossible for these animals to copulate in the water, to any purpose, even if they made the attempt, *which as yet I have failed to observe*, although I have watched them

with a sharp eye for an exhibition of the kind in the water during the whole of two seasons, and not a solitary example has been afforded me. The playing out at sea, where a couple of seals will roll and idly thrust up their flippers now and then, scratch, &c., has been, I believe, mistaken for the act of copulation. I am certain, from all my observation, that the bull must have the female on some firm foundation before he can cover her effectually, and am confident that, the more the thing is observed in the future, the correctness of my opinion will be appreciated by those who may doubt it. The position of the genital organs alone, which are precisely homologous to those of the dog, would go to settle it in favor of terrestrial action. When observing them on the breeding-grounds, I never saw an able-bodied bull fail to effect the operation when both parties were ready, provided they had no exceptional condition of the ground where they might be lying at the moment of impulse. Cases, however, are not unusual in which the cow, being so much smaller, sometimes gets in between a couple of rocks, or similarly awkward position, just wide enough to allow her body to drop between, but too narrow for the bull, which cannot settle down upon her; but in the course of time she gets restless and shifts her position, when the affair is at once consummated.

I am inclined to think that the cows only require to be covered once, but I cannot state it to be so, from my inability to mark them, and to be on the ground all the time.

The cows appear to go to and come from the water quite frequently, and usually return to the spot, or its neighborhood, where they leave their pups, crying out for them, and recognizing the individual replies, though ten thousand around, all together, should *blaat* at once. They quickly single out their own and attend them. It would be a very unfortunate matter if the mothers could not identify their young by sound, since their pups get together like a great swarm of bees, spread out upon the ground in "pods," or groups, while they are young, and not very large, but by the middle and end of September, until they leave in November, they cluster together, sleeping and frolicking by tens of thousands. A mother comes up from the water, where she has been to wash, and perhaps to feed, for the last day or two, to about where she thinks her pup should be, but misses it, and finds, instead, a swarm of pups in which it has been incorporated, owing to its great fondness for society. The mother, without at first entering into the crowd of thousands, calls out, just as a sheep does for her lamb, listens, and out of all the din she—if not at first, does at the end of a few more trials—recognizes the voice of her offspring, and then advances, striking out right and left and over the crowd, toward the position from which it replies; but if the pup at this time happens to be asleep she hears nothing from it, even though it were close by, and in this case the cow, after calling for a time without being answered, curls herself up and takes a nap, or lazily basks, and is most likely more successful when she calls again.

The pups themselves do not know their mothers, but they are so constituted that they incessantly cry out at short intervals during the whole time they are awake, and in this way a mother can pick, out of the monotonous blaating of thousands of pups, her own, and she will not permit any other to suckle.

OLD MALE FUR SEAL, OR "SEECATCH."

As he appears at the end of the season, and after three months of fasting—Sakannon Rookery—August 18, 1872.

Between the end of July and the 5th or 8th of August the rookeries are completely changed in appearance; the systematic and regular disposition of the families, or harems, over the whole extent of ground has disappeared; all order heretofore existing seems to be broken up. The rutting-season over, those bulls which held positions now leave, most of them very thin in flesh and weak, and I think a large proportion of them do not come out again on the land during the present season; and such as do come, appear, not fat, but in good flesh, and in a new coat of rich, dark and gray-brown hair and fur, with gray and grayish-ochre "wigs," or over-hair on the shoulders, forming a strong contrast to the dull, rusty-brown and umber dress in which they appeared during the summer, and which they had commenced to shed about the 15th of August, in common with the cows and bachelor seals. After these bulls leave, at the close of their season's work, those of them that do return to the land do not come back until the end of September, and do not haul up on the rookery-grounds as a rule, preferring to herd together, as do the young males, on the sand-beaches and other rocky points close to the water. The cows, pups, and those bulls which have been in retirement, now take possession, in a very disorderly manner, of the rookeries; also, come a large number of young, three, four, and five year old males, who have not been permitted to land among the cows, during the rutting-season, by the older, stronger bulls, who have savagely fought them off whenever they made (as they constantly do) an attempt to land.

Three-fourths, at least, of the cows are now off in the water, only coming ashore to nurse and look after their pups a short time. They lie idly out in the rollers, ever and anon turning over and over, scratching their backs and sides with their fore and hind flippers. Nothing is more suggestive of immense comfort and enjoyment than is this action of these animals. They appear to get very lousy on the breeding-ground, and the frequent winds and showers drive and spatter sand into their fur and eyes, making the latter quite sore in many cases. They also pack the soil under foot so hard and solid that it holds water in the surface depressions, just like so many rock basins, on the rookery; out and into these puddles they flounder and patter incessantly, until evaporation slowly abates the nuisance.

The pups sometimes get so thoroughly plastered in these muddy, slimy puddles, that their hair falls off in patches, giving them the appearance of being troubled with scrofula or some other plague, at first sight, but they are not, from my observation, permanently injured.

Early in August (8th) the pups that are nearest the water on the rookeries essay swimming, but make slow and clumsy progress, floundering about, when over head in depth, in the most awkward manner, thrashing the water with their fore flippers, not using the hinder ones. In a few moments, or a minute at the most, the youngster is so weary that he crawls out upon the rocks or beach, and immediately takes a recuperative nap, repeating the lesson as quick as he awakes and is rested. They soon get familiar with the water, and delight in it, swimming in endless evolutions, twisting, turning, diving, and, when exhausted, they draw up on the beach again, shake themselves as young dogs do, either going to sleep on the spot, or having a lazy frolic among themselves.

Now, in this matter of learning to swim, I have not seen any "driving" of the young pups into the water by the old in order to teach them this process, as has been affirmed by writers on the subject of seal-life.

The pups are constantly shifting, at the close of the rutting-season, back and forth over the rookery in large squads, sometimes numbering thousands. In the course of these changes of position they all come sooner or later in contact with the sea; the pup blunders into the water for the first time in a most awkward manner, and gets out again as quick as it can, but so far from showing any fear or dislike of this, its most natural element, as soon as it rests from its exertion, is immediately ready for a new trial, and keeps at it, if the sea is not too stormy or rough at the time, until it becomes quite familiar with the water, and during all this period of self-tuition it seems to thoroughly enjoy the exercise.

By the 15th of September all the pups have become familiar with the water, have nearly all deserted the back-ground of the rookeries and are down by the water's edge, and skirt the rocks and beaches for long distances on ground previously unoccupied by seals of any class.

They are now about five or six times their original weight and are beginning to shed their black hair and take on their second coat, which does not vary at this age between the sexes. They do this very slowly, and cannot be called out of moulting or shedding until the middle of October, as a rule.

The pup's second coat, or sea-going jacket, is a uniform, dense, light pelage, or under-fur, grayish in some, light-brown in others, the fine, close, soft, and elastic hairs which compose it being about one-half of an inch in length, and over-hair, two-thirds of an inch long, quite coarse, giving the color by which you recognize the condition. This over-hair, on the back, neck, and head, is a dark chinchilla-gray, blending into a white, just tinged with a grayish tone on the abdomen and chest. The upper lip, where the whiskers or moustache takes root, is of a lighter-gray tone than that which surrounds. This moustache consists of fifteen or twenty longer or shorter whitish-gray bristles (one-half to three inches) on each side and back of the nostrils, which are, as I have before said, similar to that of a dog.

The most attractive feature about the fur-seal pup, and upwards as it grows, is the eye, which is exceedingly large, dark, and liquid, with which, for beauty and amiability, together with intelligence of expression, those of no other animal can be compared. The lids are well supplied with eyelashes.

I do not think that their range of vision on land, or out of the water, is very great. I have had them (the adults) catch sight of my person, so as to distinguish it as a foreign character, three and four hundred paces off, with the wind blowing strongly from them toward myself, but generally they will allow you to approach very close indeed, before recognizing your strangeness, and the pups will scarcely notice the form of a human being until it is fairly on them, whereupon they make a lively noise, a medley of coughing, spitting, snorting, and blaating, and get away from its immediate vicinity, but instantly resume, however, their previous occupation of either sleeping or playing, as though nothing had happened.

But the power of scent is (together with their hearing, before mentioned) exceedingly keen, for I have found that I

FUR SEAL HAREM.

Showing the relative size of the male and females, young, various attitudes, positions, etc.—St. Paul's Island—June 29, 1872.

would most invariably awake them from soundest sleep if I got to the windward, even when standing a considerable distance off.

To recapitulate and sum up the system on the rookeries of reproduction as the seals seem to have arranged it, I would say, that—

First. The earliest bulls appear to land in a negligent, indolent way, shortly after the rocks at the water's edge are free from ice, frozen snow, etc. This is generally about the 1st to the 5th of May. They land at first, as last, in perfect confidence and without fear, very fat, and average weight of 500 pounds; some staying at the water's edge, some going away back, in fact all over the rookery.

Second. That by the 10th or 12th of June, all the stations on the rookeries have been mapped out, fought for, and held in waiting for the cows by the strongest and most enduring bulls, who are, as a rule, never under six years of age, and sometimes three, and even occasionally, four times as old.

Third. That the cows make their first appearance, as a class, by the 12th or 15th of June, in rather small numbers, but by the 23d and 25th of this month they begin to flock up so as to fill the harems very perceptibly, and by the 8th or 10th of July they have most all come, stragglers excepted; average weight 80 pounds.

Fourth. That the rutting-season is at its height from the 10th to the 15th of July, and that it subsides entirely at the end of this month and early in August.

Fifth. That the cows receive the bull when three years old, thus bearing their first young when four years of age.[1]

Sixth. That the cows are limited to a single pup each, as a rule, in bearing, and this is born soon after landing; no exception has thus far been witnessed.[2]

Seventh. That the bulls who have held the harems leave for the water in a straggling manner at the close of the rutting-season, greatly emaciated, not returning, if at all, until six or seven weeks have elapsed, and that the regular systematic distribution of families over the rookeries is at an end for the season, a general medley of young bulls now free to come up from the water, old males who have not been on seraglio duty, cows, and an immense majority of pups, since only about 25 per cent. of their mothers are out of the water at a time.

The rookeries lose their compactness and definite boundaries by the 25th to 28th July, when the pups begin to haul back and to the right and left in small squads at first, but as the season goes on, by the 18th August, they swarm over

[1] This has been a vexed question with me as to when the young cows come into heat. Along toward the end of September large harems of young cows, presided over by bulls, young and old, are scattered in a disorderly manner over both the rookeries and the hauling-grounds; but close and persistent observation on my part failed to detect any commerce between them; the bulls seeming to take just as much care, in the same way, of the pups. It is most likely that they mix in with the great mass of older and pregnant cows when they come up in July, and then, of course, it is impossible to say, out of such vast numbers, which have pups and which have not, when they are covered. It is possible that they come up in their second year, but from my observation I feel justified in saying not.

[2] But Dr. McIntire affirms one case observed by himself.

three and four times the area occupied by them when born on the rookeries. The system of family arrangement and definite compactness of the breeding-classes begins at this date to break up.

EIGHTH. That by the 8th or 10th of August the pups born nearest the water begin to learn to swim, and by the 15th or 20th of September they are all familiar more or less with it.

NINTH. That by the middle of September the rookeries are entirely broken up, only confused, straggling bands of cows, young bachelors, pups, and small squads of old bulls, crossing and recrossing the ground in an aimless, listless manner; the season is over, but many of these seals do not leave these grounds until driven off by snow and ice, as late as the end of December and 12th of January.

This recapitulation is the sum and substance of my observations on the rookeries, and I will now turn to the consideration of the—

"HAULING-GROUNDS," upon which the yearlings and most all the males under six years come out from the sea in squads from a hundred to a thousand, and, later in the season, by hundreds of thousands, to sleep and frolic, going sometimes a quarter to a half of a mile back from the sea, as at English Bay.

This class of seals are termed "holluschukie" (or "bachelor seals") by the natives. It is with the seals of this division that these people are most familiar, since they are, together with a few thousand pups and some old bulls, the only ones driven up to the killing-grounds for their skins, for reasons which are excellent, and which shall be given further on.

Since the "holluschukie" are not permitted by their own kind to land on the rookeries and rest there, they have the choice of two methods of landing and locating.

One of these opportunities, and least used, is to pass up from and down to the water, through a rookery on a pathway left by common consent between the harems. On these lines of passage they are unmolested by the old and jealous bulls, who guard the seraglios on either side as they go and come; generally there is a continual file of them on the way, traveling up or down.

As the two and three year old holluschukie come up in small squads with the first bulls in the spring, or a few days only later, these common highways between the rear of the rookery-ground and the sea get well defined and traveled over before the arrival of the cows; for just as the bulls crowd up for their stations, so do the bachelors, young and old, increase. These roadways may be termed the lines of least resistance in a big rookery; they are not constant; they are splendidly shown on the large rookeries of Saint Paul's, one of them (Tolstoi) exhibiting this feature finely, for the hauling-ground lies up back of the rookery, on a flat and rolling summit, 100 to 120 feet above the sea-level. The young males and yearlings of both sexes come through the rookery on these narrow pathways, and, before reaching the resting-ground above, are obliged to climb up an almost abrupt bluff. by following and struggling in the little water-runs and washes which

FUR SEAL MALES.

Waiting for their "harems;" the females beginning to arrive—June 10, 1872.

are worn into its face. As this is a large hauling-ground, on which fifteen or twenty thousand commonly lay every day during the season, the sight always, at all times, to be seen, in the way of seal climbing and crawling, was exceedingly novel and interesting. They climb over and up to places here where a clumsy man might at first sight say he would be unable to ascend.

The other method, by which the "holluschukie" enjoy themselves on land, is the one most followed and favored. They, in this case, repair to the beaches unoccupied between the rookeries, and there extend themselves out all the way back from the water as far, in some cases, as a quarter of a mile, and even farther. I have had under my eye, in one straightforward sweep, from Zapad-nee to Tolstoi, (three miles,) a million and a half of seals, at least; (about the middle of July.) Of these I estimated fully one-half were pups, yearlings, and "holluschukie." The great majority of the two latter classes were hauled out and packed thickly over the two miles of sand-beach and flat which lay between the rookeries; many large herds were back as far from the water as a quarter of a mile.

A small flock of the younger ones, from one to three years old, will frequently stray away back from the hauling-ground lines, out and up on to the fresh moss and grass, and there sport and play, one with another, just as puppy-dogs do; and when weary of this gamboling, a general disposition to sleep is suddenly manifested, and they stretch themselves out and curl up in all the positions and all the postures that their flexible spines and ball-and-socket joints will permit. One will lie upon his back, holding up his hind flippers, lazily waving them in the air, while he scratches or rather rubs his ribs with the fore hands alternately, the eyes being tightly closed; and the breath, indicated by the heaving of his flanks, drawn quickly but regularly, as though in heavy sleep; another will be flat upon his stomach, his hind flippers drawn under and concealed, while he tightly folds his fore feet back against his sides, just as a fish will sometimes hold its pectoral fins; and so on, without end of variety, according to the ground and disposition of the animals.

While the young seals undoubtedly have the power of going without food, they certainly do not sustain any long fasting periods on land, for their coming and going is frequent and irregular; for instance, three or four thick, foggy days will sometimes call them out by hundreds of thousands, a million or two, on the different hauling-grounds, where, in some cases, they lie so closely together that scarcely a foot of ground over acres in extent is bare; then a clearer and warmer day will ensue, and the ground before so thickly packed with animal life will be almost deserted, comparatively, to be filled again immediately on the recurrence of favorable weather. They are in just as good condition of flesh at the end of the season as at the first of it.

These bachelor seals are, I am sure, without exception, the most restless animals in the whole brute creation; they frolic and lope about over the grounds for hours, without a moment's cessation, and their sleep after this is short, and is accompanied with nervous twitchings and uneasy movements; they seem to be fairly brimful and overrunning with warm

life. I have never observed anything like ill-humor grow out of their playing together; invariably well pleased one with another in all their frolicsome struggles.

The pups and yearlings have an especial fondness for sporting on the rocks which are just at the water's level, so as to be alternately covered and uncovered by the sea-rollers. On the bare summit of these water-worn spots they struggle and clamber, a dozen or two at a time, occasionally for a single rock; the strongest or luckiest one pushing the others all off, which, however, just redouble their efforts and try to dislodge him, who thus has, for a few moments only, the advantage; for with the next roller and the other pressure, he generally is ousted, and the game is repeated. Sometimes, as far as I could see, the same squad of "holluschukie" played around a rock thus situated, off "Nah Speel" rookery, during the whole of one day; but, of course, they cannot be told apart.

The "holluschukie," too, are the champion swimmers; at least they do about all the fancy tumbling and turning that is done by the fur-seals when in the water around the islands. The grave old bulls and their matronly companions seldom indulge in any extravagant display, such as jumping out of the water like so many dolphins, describing, as these youngsters do, beautiful elliptic curves, rising three and even four feet from the sea, with the back slightly arched, the fore flippers folded back against the sides and the hinder ones extended and pressed together straight out behind, plumping in head first, re-appearing in the same manner after an interval of a few seconds.

All classes will invariably make these dolphin-jumps when they are suddenly surprised, or are driven into the water, turning their heads, while sailing in the air, between the "rises" and "plumps," to take a look at the cause of their disturbance. They all swim with great rapidity, and may be fairly said to dart with the velocity of a bird on the wing, along under the water; and in all their swimming I have not been able yet to satisfy myself how they used their long, flexible, hind feet, other than as steering mediums. The propelling motion, if they have any, is so rapid that my eye is not quick enough to catch it; the fore feet, however, can be very distinctly seen to work, feathering forward and sweeping back flatly, opposed to the water, with great rapidity and energy, and are evidently the sole propelling power.

All their movements in the water, when in traveling or sport, are quick and joyous, and nothing is more suggestive of intense satisfaction and great comfort than is the spectacle of a few thousand old bulls and cows, off and from a rookery in August, idly rolling over, side by side, rubbing, and scratching with the fore and hind flippers, which are here and there stuck up out of the water like lateen-sails, or "cat-o'-nine tails," in either case, as it may be.

When the "holluschukie" are up on land they can be readily separated into two classes by the color of their coats, viz, the yearlings, and the two, three, four, and five year old bulls.

The first class is dressed just as they were after they shed their pup-coats and took on the second, last year, in September and October, and now, as they come out in the spring and summer, the males and females cannot be distinguished

FUR SEAL "ROOKERY."

Breeding grounds at Polavina Point, St. Paul's Island—July 18, 1872.

apart, either by color or size; both yearling sexes having the same gray backs and white bellies, and are the same in behavior, action, weight, and shape.

About the 15th and 20th of August they begin to grow "stagey," or shed, in common with all the other classes, the pups excepted. The over-hair requires about six weeks from the commencement of the dropping, or falling out of the old, to its full renewal.

The pelage, or fur, which is concealed externally by the hair, is also shed, and renewed in the same manner and time; but, being so much finer than the hair, it is not so apparent. It was to me a great surprise to "learn," from a man who has been heading a seal-killing party on these Islands during the past three years, and the Government agent in charge of these interests, that the seal never shed its fur; that the over-hair only was cast off and replaced. To prove that it does, however, is a very simple matter, and does not require the aid of a microscope. For example, take up a prime spring or fall skin, after every single over-hair on it has been plucked out, and you will have difficulty, either to so blow upon the thick, fine fur, or to part it with the fingers, as to show the hide from which it has grown; then take a "stagey" skin, by the end of August and early in September, when *all the over-hair is present, about one-third to one-half grown*, and the first puff you expend upon it easily shows the hide below, sometimes quite a broad welt. This under-fur, or pelage, is so fine and delicate, and so much concealed and shaded by the coarse over-hair, that a careless eye may be pardoned for any such blunder, but only a very casual observer could make it.

The yearling cows retain the colors of the old coat in the new, and from this time on shed, year after year, just so, for the young and the old cows look alike, as far as color goes, when they haul up on the rookeries in the summer.

The yearling males, however, make a radical change, coming out from their "staginess" in a uniform dark-gray and gray-black mixed and lighter, on the under and upper parts, respectively. This coat, next year, when they come up on the hauling-grounds, is very dark, and is so for the third, fourth, and fifth years, when, after this, they begin to grow more gray and brown, year by year, with rufous-ochre and whitish-gray tipped over-hair on the shoulders. Some of the very old bulls become changed to uniform dull grayish-ochre all over.

The female does not get her full growth and weight until the end of her fourth year, so far as I have observed, but does the most of her growing in the first two.

The male does not get his full growth and weight until the close of his seventh year, but realizes most of it by the end of the fifth, osteologically, and from this it may be, perhaps, truly inferred that the bulls live to an average age of eighteen or twenty years, if undisturbed in a normal condition, and that the cows attain ten or twelve under the same circumstances. Their respective weights, when fully mature and fat in the spring, will, I think, strike an average of four to five hundred pounds for the male and from seventy to eighty for the female.

From the fact that all the young seals do not change at all in weight, from the time of their first coming out in the

spring till that of their leaving in the fall and early winter, I feel safe in saying, since they, too, are constantly changing from land to water and from water to land, that they feed at irregular but not long intervals during the time they are here under observation. I do not think any of the young males fast longer than a week or ten days at a time. I have always found excrementitious matter and traces on their hauling-grounds whenever I went among them; and also when started up suddenly, most of them, on some days more than others, would void a considerable urine. Their evacuations are exactly similar in color (when not chlorodized by eating algæ) and consistency to those of a young calf, and it would be impossible to speak of their frequency or the amount voided on these porous, sandy flats and beaches, where the incessant pattering of their flippers, crossing and recrossing the ground, will almost instantly wipe them and their traces out, for at the end of the season these grounds, as well as the rookeries, are just as free from the presence of fecal matter as they are in the spring, when they are bare and deserted and have been washed by melting snow.

But they do leave evidences of their being on these great reproductive fields, chiefly on the rookeries, such as hundreds of the dead carcasses of those of them who have been infirm, sick, killed, or who have crawled off to die from death-wounds received in some struggle for a harem; and over these decaying, putrid bodies the living, old and young, clamber and patter, and by this constant stirring up of putrescent matter give rise to an exceedingly disagreeable and far-reaching "funk," which has been, by all the writers who have spoken on the subject, referred to as the smell which these animals have in rutting. If these creatures have any such odor peculiar to them when in this condition, I will frankly confess that I am unable to distinguish it from the fumes which are constantly being stirred up and rising out from these decaying carcasses of old seals and the many pups which have been killed accidentally by the old bulls while fighting with and charging back and forth against one another.

They do, however, have a peculiar smell when they are driven and get heated; their steaming breath-exhalations possess a disagreeable, faint, sickly tone, but it can by no means be confounded with what is universally understood to be the rutting-odor among animals. The finger rubbed on a little fur-seal blubber will smell very much like that which is appreciated in their breath coming from them when driven, only stronger. Both the young and old fur-seals have this same breath-smell at all seasons.

By the end of October and the 10th of November the great mass of the "holluschukie" have taken their departure; the few that remain from now until as late as the snow and ice will permit them to do, in and after December, are all down by the water's edge, and hauled up almost entirely on the rocky beaches only, deserting the sand. The first snow falling makes them uneasy, as also does rain-fall. I have seen a large hauling-ground entirely deserted after a rainy day and night by its hundreds of thousands of occupants. The falling drops spatter and beat the sand into their eyes, fur, &c., I presume, and in this way make it uncomfortable for them.

The weather in which the fur-seal delights is cool, moist, foggy, and thick enough to keep the sun always obscured so as

REEF "ROOKERY" AND PARADE.

(See-Vitchie Cammin" and other Island in distance) looking south from Gartrich, St. Paul's Island—June 20, 1872.

to cast no shadows. Such weather, continued for a few weeks in June and July, brings them up from the sea by millions; but, as I have before said, a little sunlight and the temperature as high as 50° to 55°, will send them back from the hauling-grounds almost as quickly as they came. These sunny, warm days are, however, on Saint Paul's Island, very rare indeed, and so the seals can have but little ground of complaint, if we may presume that they have any at all.

I saw but three albino pups among the hundreds of thousands on Saint Paul's, and none on Saint George. They did not differ in any respect from the other (normal) pups in size and shape. Their hair, in the first coat, was, all over, a dull ochre; the flippers and muzzle were a flesh-tone, and the iris of the eye sky-blue. The second coat gives them a dirty yellowish-white color, but it makes them exceedingly conspicuous when in among the black pups, gray yearlings, and "holluschukie."

I have also never seen any malformations or "monsters" among the pups and other classes of the fur-seal; nor have the natives recorded anything of the kind, so far as I could ascertain from them.

THE FUR-SEAL LIFE ON THE PRYBILOV ISLANDS.

ITS INCREASE OR DIMINUTION.

With regard to the *increase* of the seal-life, I do not think it within the power of human management to promote this end to the slightest appreciable degree beyond its present extent and condition in a state of nature; for it cannot fail to be evident, from my detailed description of the habits and life of the fur-seal on these Islands, during a great part of the year, that could man have the same supervision and control over this animal during the *whole* season, such as he has at his command while they visit the land, he might cause them to multiply and increase, as he would so many cattle, to an indefinite number; but, unfortunately, for nearly six months out of every year the fur-seal is far beyond the reach or even cognizance of any one, where it is exposed to known powerful and destructive natural enemies, and many others, probably, unknown, which prey upon it, and, in accordance with a well-recognized law of nature, keep it at its present number, which has been for ages, and will be in the future, as affairs now are, *its maximum limit of increase;* for did this law not hold good in the animal kingdom, regulating the increase of life in a state of nature, these Seal-Islands would have been literally covered with swarms of these valuable pinnipedes long, long before the first human being ever looked in upon them. They have, however, neither increased nor diminished to any noteworthy degree from the date of their discovery, in 1786–'87, up to the present writing.

With reference to the amount of ground covered by the seals when the Russians took possession, I have received from the natives information fully corroborating the view above taken, who point out to me ground occupied by the fur-seal, many years ago, as *rookeries* and *hauling-grounds*, which has been for a long time and is still deserted by them; while, on the other hand, they show me new ground now covered by seals which was previously unoccupied. After carefully surveying the new ground of the present, and comparing it with that area now deserted by them, I feel justified in stating that the fur-seals on the Prybilov Islands have not increased, nor have they diminished, as a body, to any noteworthy degree, being, in the aggregate, about the same number to-day as when first discovered; and this also goes to prove that they are not particularly attached, as individuals, to the respective locations of their breeding-grounds year after year, inas-

FUR SEAL HAREM.

Male and Females, proportionate sizes—Reef Rookery, St. Paul's Island—June 14, 1872.

much as the rookeries are seldom filled season to season regularly, for a rookery will this year be much larger than it was last, and is likely to be smaller the next, although the aggregate number on the Island is continually about the same.

I have no hesitation in saying, quite confidently, that under the present rules and regulations now in force and governing the sealing interests on these Islands, the increase or the diminution of seal-life will amount to nothing, either one way or the other. The killing annually of one hundred thousand animals out of the yearly visitation of five or six millions, as it is now conducted, does not sensibly affect the ratio of the masses at all from season to season, and it is to this subject of increasing the killing of the surplus males or non-breeders that I wish to call especial attention in the following essay on the management of the sealing interests.

THE MANAGEMENT OF THE SEALING INTERESTS ON THE PRYBILOV ISLANDS, WITH A VIEW TO THEIR FULL DEVELOPMENT.—How near the results of my observation and study, on the heads which come under this topic, will conform with those by the Russians carried out and understood, I am unable to say at the present time, for I found nothing in the way of Russian books or manuscripts concerning the matter, under discussion, on the Islands; and that the natives, together with both agents of the Government and the lessees, were only carrying out the mechanical routine established by the Russians years ago, who evidently comprehended many of the laws or habits governing the seal-life on these Islands, and who made an excellent practical application of this knowledge, with a view to the preservation in the future of this valuable interest, although they have never given to the world any definite information on the subject.

The Rookeries.—As the seals land confidently from first to last, and in no degree wild or wary, the breeding-grounds may, and should be, inspected through and through, every few days, by the agent in charge of affairs, from the time of the early arrivals in May, until the period of general departure in the autumn, in order that he may map down and fix in black and white the precise boundaries assumed by the breeding seals for the season, giving the result at the close of his labor of an accurate survey of the *area* and *position* of the ground covered during the season by the cows, bulls, and pups, on the rookeries, so that he can at once detect any change that may and is likely to occur in their hauling and numbers for the next season.

This is the only way in which the DEFINITE, RELIABLE INFORMATION can be secured upon which to found a report, year after year, as to the numbers or extent and importance of the seal-life on these grounds, detecting any increase or diminution of the same, as season succeeds season. *This step on the part of the Government agent is of the first importance, and necessary, in my opinion.*

During the first week or so of inspection, early arrivals, some of them, will frequently stampede, as it were, more or less back into the water, when approached, but these bulls soon return. By the end of May, however, these bulls will hardly move to the right or the left when you attempt to pass through them. At this time, about two weeks before the

females begin to come, as a whole, they are and continue quite indifferent to all the sights, sounds, and smells which they may be subjected to for the rest of the season.

The seals upon the rookeries and hauling-grounds are not in the least affected by the smell of blood and carrion, arising from the killing-grounds, or from the stench from blubber-fires constantly wafted from the native villages.

This is well illustrated by the two rookeries close to the village of Saint Paul's. (See map). The one on the spit at the head of the lagoon is not more than forty yards south of the great killing-grounds, upon which a hundred thousand carcasses are ever rotting. The seals can smell the blood and carrion upon this rookery almost from the moment they land in the spring, as they face this slaughter-field, looking north and east, and half the prevailing winds during the summer season come from this direction; while the general southerly winds are wafting to them the odor and sounds of the village, &c., all amounting to nothing, as far as the seals are concerned, as this rookery has been increasing, so the natives say, steadily during the past two years. The seals, everywhere on the rookeries, will become habituated and indifferent to quiet and undemonstrative visitors, and suffer men to approach, after a few visits previously, without paying much attention to them.

Selection and Rule in Killing.—As the proportion of males and females is about equal at birth, the polygamous nature of these animals will allow of the killing of seven out of every ten males, without any injury whatever to the rookeries, and leave still a large surplus of bulls for the breeding-grounds, but a good margin should be left for the death-rate, which must be larger among the bulls, both on land and in the sea, by reason of their more adventurous and less timid disposition; and also the great labor and unceasing vigilance which they insist upon assuming and maintaining on the rookeries three and four months every year, must tend to render quite a large number partially or wholly impotent for the repetition of their duties.

A thorough and systematic routine of thinning out the surplus males should be at once taken in hand, but let it be done gradually and the effect closely watched upon the rookeries, year after year.

These animals are systematic and regular in all their habits on these Islands, and are therefore amenable to the most correct of all methods for their management, and this is a *systematic routine*, year after year.

On this ground I find strong objection to the irregular manner in which *all* classes of young males are taken on the Islands under the present law, which is incompatible with anything like a correct order or business-like manner of managing them with the object of steadily promoting the increase of the annual yield, if this is practicable.

By taking, however, any *one* class of the males, those under two years, and not over five, and confine the killing to this class selected *alone*, year after year, then it will be known in just what ratio the surplus males are being thinned out, and this ratio can be kept, so as not to interfere with the regular augmentation of fresh young bulls every year to supply and serve the demand from the rookeries. To preserve this proportion of males fresh

SEAL GROUNDS AT ENGLISH BAY.

Looking east from Zapadrie, St. Paul's Island—September 20, 1872.

for service and eligible every season, is absolutely necessary to the success of any experiment as to the probability of *greatly* increasing the yield annually, *without affecting the present condition;* there is no other way than the one I have pointed out, for no man, without superhuman aid, can preserve these proportions correctly, and kill as the killing is now conducted; as by this, the present irregular procedure,[1] the agent will be killing this year the animals, in whole or in part, which he spared last season for service on the breeding-grounds hereafter, and thus the rookeries cannot receive their fair quota of six-year-old bulls every season, and this supply is indispensable to their regular and undisturbed progression, PROVIDED, *the number of killable seals is steadily increased every year, as it should be,* in order to properly develop the value and importance of these interests; *and let this increase be gradual, not over ten thousand per annum.*

Now, should this regular increased killing, which I propose, prove to be injurious by causing any diminution of the seal-life, the agent here in charge of these valuable interests can at once detect the falling off as promptly as he would any increase, provided he is an able man and adopts the course, or some one similar, to that which I have indicated, and can at once stay further action in this direction. But I see no reason why an augmentation of 10,000 regularly every year should not be made, until that point of taking seven-tenths of the males shall be touched, and the effect, be it ever so slight, on the rookeries, observed, and this to the best interests of all parties concerned—*watching the rookeries on one hand, and not overstocking the market on the other.* There is no reason why affairs should be left in their present condition, which is the result, as far as the Government is concerned, of an accident, as it were, full of blunders, and does not point in any way toward the future development of these novel and valuable interests. But should any increase be made of killing, to any noteworthy degree, under the present *régime,* nothing but positive injury will ensue, and this will be plain upon an examination, as I have made, into the matter.

Taking the Seals.—The admirable manner in which the natives capture and drive the "holluschukie" up from the hauling-grounds to the slaughtering-fields, near the villages and elsewhere, cannot be improved upon, and is most satisfactory.

In the early part of the season, large bodies of the young bachelor-seals do not haul up on land very far from the water, a few rods at the most, and the men are obliged to approach slyly and run quickly between the dozing seals and the surf, before they take an alarm and bolt into the sea; and in this way a dozen men, running down the long sand-beach of English Bay, on some driving-morning, early in June, will turn back from the water thousands

[1] All classes of the males are knocked down and taken between the ages of one and five years, just about as they happen to come upon the killing-grounds. For instance, in 1868–'69, a large portion, about one-half, of the seals killed on Saint Paul's (300,000) were yearlings; in 1871, 75,000 two, three, and four year old bulls, (a great proportion of this year's taking was three and four year old bulls;) and in 1872, 75,000 were taken, the greater part of this number being two-year olds. In 1873, the great proportion of 75,000 on Saint Paul's was three and four year olds, &c.

of seals, just as the mold-board of a plow lays over a furrow of earth. As the seals are first startled they arise, and, seeing men between them and the water, immediately turn, lope, and scramble rapidly back upon the land. The natives then leisurely walk on the flanks and in the rear of the drove thus secured, directing and driving them over to the killing-grounds.

A drove of seals on hard and grassy ground, cool and moist weather, are driven at the rate of about half a mile an hour. They can be urged along, at the expenditure of a great many lives in the drove, at the speed of a mile, or a mile and a quarter even, per hour, but this is not advisable, and is seldom ever done. A bull-seal, fat and unwieldy, cannot travel with the younger males, who will lope, or gallop, as it were, over the ground as fast as an ordinary man can run, for a few hundred yards, but then will fall to the earth utterly exhausted, hot, and gasping for breath.

The seals, when thus driven to the killing-grounds, require but little urging; only let it be constant; and they are permitted to frequently halt and cool off, as heating them injures their fur. They never show fight, any more than a flock of sheep would do, unless they have a few old bulls mixed in, which frequently get so weary that they prefer to come to a stand-still and fight, rather than to move; and these bulls are always gladly left behind, inasmuch as the fur on them is of little or no value, the pelage being very much shorter, coarser, and more scant than in the younger, especially on parts posteriorly. This change in the condition of the fur seems to set in at the time of their shedding, in the fifth year. How it is with the cows I have had no opportunity of making an examination, and cannot, therefore, speak, as they are left undisturbed.

As the drove progresses, the seals all move in about the same way—the walking step, which I have before described, and a sliding, shambling gallop—and the progression of the whole body is a succession of starts, spasmodic and irregular. Every now and then a seal will get weak in the lumbar regions, and drag his posteriors after him for a short distance, finally dropping breathless and exhausted, not to revive for hours, days, perhaps, and often, never. Quite a large number of the weaker ones are thus, on the driest driving-days, laid out and left on the road. This will happen, no matter how carefully they may be driven, and the death loss is quite large on the longer drives, as much as 3 and 4 per cent., and I feel quite satisfied that a large number of those rejected from the drove on the killing-ground, being ineligible from under or over age, condition, &c., and permitted to return to the water, die subsequently from internal injuries sustained on the drive from over-exertion.

I, therefore, am opposed to making drives over any distance exceeding half a mile, or a mile, at the most, and urge the erection of salt-houses and establishment of killing-grounds adjacent to all of the great hauling-grounds on Saint Paul's Island. Saint George is already well provided for in this respect. It is, however, of little importance,

BREEDING GROUNDS OF THE FUR SEAL.

At North East Point, looking west from the Sea-lion Neck, St. Paul's Island—August 20, 1872.

compared to Saint Paul's, for the sealing-interests do not, and never will, relatively speaking, amount to much, in comparison with those upon this, the largest and most important Island.

Owing to one of the many gross blunders made by the Government agent sent up here to report upon the Seal-Islands, take charge, &c., the number of seals upon Saint George's Island has been put down by this officer, in his report, at *one-half* of that on Saint Paul's, when, after carefully surveying the two Islands, I find that less than *one-twentieth* of the number frequenting Saint Paul's Island are to be found on Saint George. The rookeries and hauling-grounds on Saint George are just as large now as they ever have been in the memory of man. (See maps, figures, &c.)

On the authority of the people resident I will here also take occasion to state that Saint George has never been resorted to much for breeding or hauling by the fur-seal, for the natives of this place at the present time give me plainly to understand that as late as fifty or sixty years ago the sea-lion (*Eumetopias stelleri*) was the dominant animal; that it not only occupied all the ground now taken by the fur-seals on this Island, but more, and then exceeded the present number of the fur-seal;[1] but, being so much more shy and wary, this less valuable seal has been steadily and rapidly diminishing in number, (now only 3,000 to 4,000,) while the fur-seal has been just as steadily increasing ever since the Island became inhabited by human beings. But the number of fur-seals upon Saint George, owing to the character and extent of the landing-ground, can never increase to any important figure compared with Saint Paul's Island; and it is evident that that land is not the objective point for this animal, as the latter Island most emphatically is. There is not the slightest danger of ever over-driving on Saint George. All the eligible seals that can be found there in season may be safely taken. The rookeries there will be governed by the condition of those on Saint Paul only, and in no other way, while I consider the hauling-grounds there (on Saint George) visited mainly by the stragglers from the great bands ever going and coming, during the summer and fall, to and from Saint Paul.

The seals, when brought upon the killing-grounds, are herded there until they are rested and cool. Then squads or "pods" of fifty to two hundred are driven out from the body of the drove, surrounded, and huddled up one against and over the other, by the natives, who carry each a long, heavy club of hard wood, with which they strike the seals down by blows upon the head. A single blow, well and fairly delivered, will lay any seal out, but this whacking is usually repeated three or four times before the seal's life is extinguished.

The killing-gang, under the supervision of their chief, have, before going into action, a common understanding as to what grades only to kill, sparing the others, which are permitted to escape and started off to the water as soon as the marked ones are knocked down. The men then drag the slain out from the heap in which they have fallen and spread the

[1] See Bishop Venianimoff's account, which does not confirm this statement of the natives. Appendix.

bodies over the ground, finishing the work by thrusting a long, sharp knife into the vitals of the animal, so that the bodies will not "heat" by lying one upon the other; and then another "pod" is started out, killed in this way, if a cool day, and so on until a thousand or two are laid out, or the drove is finished from which they have taken these squads.

This work of killing is performed rapidly, as is the skinning also. Forty-five men, on Saint Paul's Island, in June and July, in less than four working weeks, drove, killed, and skinned and salted the pelts of 72,000 seals, and doubtless could have managed 100,000 in the same time.

The labor of skinning is exceedingly tiresome and exhausting to a novice, and is trying to an expert, requiring long practice before the muscles of the back are so developed as to permit the man to bend down to and finish well a fair day's work.

The body of the seal, preparatory to skinning, is rolled over or put upon its back, and the native makes a single cut through its skin down along the neck, chest, and belly, from the lower jaw to the root of the tail, using for this purpose an exceedingly sharp knife; the fore and hind flippers are then successively lifted and a sweeping circular incision through the skin on them, at the point where the body-fur ends, is made; then, seizing a flap of the hide on either one side or the other of the abdomen, the native proceeds to rapidly cut the skin, at once and for all, clean and free from the blubber and flesh of the body, which he rolls steadily over and out by hauling up on the skin as he progresses in his work, standing all the time stooped down over the carcass, so that his hands are but slightly above it and the ground.

Nothing is left of the skin upon the carcass, save a small patch of each upper lip, on which the coarse moustache grows, the skin on the tip of the lower jaw, and the insignificant tail, together with the bare hide of the flippers.

The blubber of the fur-seal is of a faint yellowish-white, and lies entirely between the skin and the flesh, none being deposited in between the muscles; and around the small and large intestines a moderate quantity of a harder and firmer texture is found. It possesses an odor extremely offensive, and difficult to wash from the hands; it makes, however, a very fair oil for lubricating, burning, &c.

The flesh of the fur-seal, when carefully cleaned of fat, can be cooked and eaten by most people, who, did they not know what it was, might consider it some poor, tough, dry beef, *rather* dark in color and over-done. The pup, however, while on the land and milk-fed, is tender and juicy, but insipid.

The skins are taken from the field to the salt-houses, where they are laid out open, one upon another, "hair to fat," like so many sheets of paper, with salt profusely spread upon the fleshy sides, in "kenches" or bins; then, after lying a week or two salted in this style, they are ready for bundling and shipping, two skins to the bundle, the fur outside and strongly corded, having an average weight of about twelve to fifteen pounds when consisting of two and three year old pelts.

The Time for Taking Fur-Seals.—Owing to the official blunders, again, of the Government agents, the time and best period, too, for taking the fur-seal on the Prybilov Islands has been unnecessarily and injuriously shortened two weeks.

FUR SEAL PUPS AT SLEEP AND PLAY.

"Padding" on Zoltoi Sands, near the Village of St. Paul's—September 12, 1872.

The seals are in their best condition and in good number during the time of their first appearance, as a body, in June, up to the season of shedding, which commences about the 15th of August; and there is no reason whatever why the time of taking these animals should be restricted to the 31st of July, *for the driving of the killable seals in no way whatever affects the condition of the rookeries at any time during the six months they are here.*

The Russians had a practice of ceasing to take skins when the shedding commenced, and their calendar for this season is our 12th of August, for we are eleven days ahead of them. This blunder in the time-restriction was in the literal copying of the Russian routine, the agents of our Government being ignorant of the difference in time observed by the two nations; or most likely they failed to give the subject due attention.

The proper time-restriction, if any at all is needed beyond the number of animals assigned per annum, (*and I do not see the necessity or good of any legislation for* TIME *to take skins,*) is therefore from the 1st of June to the 15th of August; and as a skin is not fit for taking from this latter date till the end of October, as a rule, let it run from the 1st of November until the seals leave in the winter.

THE NUMBERS OF THE FUR-SEAL ON THE PRYBILOV ISLANDS—ILLUSTRATING THE EXTENT AND IMPORTANCE OF THE GOVERNMENT INTERESTS.

Early in the season of 1872 the fact became evident to me that the breeding-seals obeyed implicitly a fine instinctive *law of distribution*, so that the rookery-ground occupied by them was always covered by just so many seals in exact proportion, greater or less in number, as this ground was larger or smaller.

I was, therefore, prompted to survey and thus obtain the *area and position* of these breeding-grounds; and after closely studying the matter I settled upon the number of square feet taken by each animal, and had at once the figures for computation of the whole number on the rookeries; and to show this ground upon which I have made my report, I submit the accompanying detailed maps of all the breeding and hauling grounds on the two Islands, as heretofore, strange to say, nothing has been done toward the determination of this important matter, save vague guess-work.

The time for taking these boundaries of the breeding-grounds is during the week of their greatest expansion, or when they are as full as they are going to be for the season, *and before the regular system of compact, even organization breaks up*, and they scatter out and stray back in pods and clusters; the same number of seals then covering two and three times as much ground as when marshalled on the rookery-ground proper, between the 10th and 18th of July. This system of the breeding-grounds I have already discussed. I now submit the following plan by which I have been guided in calculating:

Plan or System of Computation.—For instance, on the Reef, Zapadnee, or at Northeast Point, the "rookeries" have an average depth of 150 feet to 200; the most narrow belts under the bluffs will not be found less than 25 or 30 feet in depth, while a great proportion of the rookery is over 250, and in some places, as will be seen by reference to the maps, stretches back from the sea 500 to 600 feet. *This ground, no matter how deep or how shallow, is covered evenly by the breeding-seals.*

When the cows and bulls haul, I deem less than two feet square to each animal a big margin, and safely under the whole number; but, then, *on this two feet square the cow doubles herself, i. e.*, brings forth her pup, and within a few days after its birth to a week or so, she visits the water, and is not one-quarter of the time again on land during the season. In this way it will be seen that the seals *almost* double themselves on the rookery-grounds, without causing the expansion of the

THE "HAULING GROUNDS" OF THE FUR SEAL.

Tolstoi Point, St. Paul's Island—Arrival of the Seals early in the season—May 2, 1872.

same beyond the limits that would be required by the adults alone, as every 100,000 breeding-seals will be found to consist of much more than 80,000 cows and far less than 20,000 bulls, and in a few weeks after landing they will show about 180,000, cows, *pups*, and bulls on the same area of ground previously occupied before the birth of the young; but not one-sixth of the cows will be seen at any one time on the rookery, as clearly shown by the swarms of pups, each one of which has a mother. Now, in addition to every 100,000 breeding-seals, we must add 15,000 or 20,000 virgin cows, coming up on to this ground for the first time to meet the bulls; so that on this location, where we at first have 100,000 breeding cows and bulls, we may correctly calculate, by the close of the season, upon *double* that number having been off and on and *born* there, so I safely figure upon *two square feet* to an animal on the breeding-grounds.

Below are the figures made from a survey of the breeding-grounds on Saint Paul's Island, July 10–18, 1872:

	Seals.
Northeast Point, or Novastoshna, has 15,840 feet sea-margin, with 150 feet average depth	1,200,000
Polavina Rookery has 4,000 feet sea-margin, with 150 feet average depth	300,000
Lukannon Rookery has 2,270 feet sea-margin, with 150 feet average depth	170,250
Keetavee Rookery has 2,200 feet sea-margin, with 150 feet average depth	165,000
Reef Rookery has 4,016 feet sea-margin, with 150 feet average depth	301,000
Garbutch Rookery has 3,660 feet sea-margin, with 100 feet average depth	183,000
Nah Speel, or Village Rookery, has 400 feet sea-margin, with 40 feet average depth	8,000
Lagoon Rookery has 750 feet sea-margin, with 100 feet average depth	37,000
Tolstoi Rookery has 3,000 feet sea-margin, with 150 feet average depth	225,000
Zapadnee Rookery has 5,880 feet sea-margin, with 150 feet average depth	441,000
Total for Saint Paul's Island, cows, bulls, and pups	3,030,250

The breeding-rookeries on Saint George's Island, surveyed July 12–15, 1873, give the following figures:

Eastern Rookery has 900 feet sea-margin, with 60 feet average depth	25,000
Little Eastern has 750 feet sea-margin, with 40 feet average width	13,000
North Rookery has 2,000 feet sea-margin, with 25 feet average width	25,000
North Rookery has 750 feet sea-margin, with 150 feet average width	52,000
Starry Ateel has 500 feet sea-margin, with 125 feet average depth	30,420
Zapadnee has 600 feet sea-margin, with 60 feet average depth	18,000
Total for Saint George's Island, cows, bulls, and pups	163,420

Grand total for both Islands of 3,193,670 breeding-seals and pups, and *exclusive of the numbers of the non-breeding seals*, which are not to be figured upon in the above manner, inasmuch as the "holluschukie" and yearlings haul upon the land in a disorderly manner, and go and come to and from the sea at frequent and irregular intervals during the season. They have no systematic method of landing and preserving definite boundary-lines for two and three weeks, as do the breeding-seals, and are therefore beyond my reach for definite calculation, and I can only give an estimate based upon my close observation of them with especial reference to this subject.

I have carefully mapped the ground out over which they hauled in 1872 on Saint Paul's, and in 1873 on Saint George's, and have arrived at this conclusion, *i. e.*, that the non-breeding seals, consisting of all the yearlings and the males under six or seven years, are nearly equal in number to the breeding-seals, and I put them down at 2,000,000, quite safely, thus making the aggregate of the seal-life over *five millions* on the Prybilov Islands, not omitting the small rookery on Otter Island, which I can only estimate upon at fifty or sixty thousand, not having had time to go over and survey it at the proper season, *i. e.*, between the 10th and 20th of July.

From these figures it will be seen that only *one-twentieth* of the whole population of the *rookeries* is found upon Saint George's Island, and the same proportion may hold good with regard to the non-breeding seals, or "holluschukie," but I am led to affirm, from my observation, that less than *one-thirtieth* visit Saint George.[1] The seals, after leaving these Islands in the fall, spread themselves out over the North Pacific, following schools of fish, or frequenting shoals or banks where an abundance of cod, &c., their natural food, is found; they sleep soundly on the surface of the water, and in this position they are captured by the natives all the way up and down the Northwest coast, from the Columbia River to Behring Sea. As soon as they leave the Islands they become shy and wary, and exceedingly difficult to approach unless caught fast asleep.[2]

That they are preyed upon extensively by sharks, killers, &c., or some other known and unknown natural foes, is at once plain; for, were they not held in check by some such cause, they would quickly multiply to so great an extent that Behring Sea itself could not contain them, and the present annual killing of one hundred thousand out of a million surplus males does not in the slightest degree aid in diminishing the seal-life or its regular perpetuation every year upon the rookeries; we can only look upon this number of five or six millions of fur-seals, seen as we see them to-day, as the maximum limit of *increase* assigned to them in a state of nature; and from this state we cannot remove them.

[1] The seals, after leaving the Islands in the fall and early winter, do not visit land again until the time of their re-appearance on these or the Russian Islands next April or May.

[2] On the killing-grounds at Saint George, June, 1873, the natives, while skinning seals, occasionally called me to notice the presence of buck-shot imbedded and encysted just under the skin, in the blubber. From one animal fifteen shot were taken. The holes which they must have made in the skin were not visible. An even thickness of hide, with uniform coating of fur and hair, covered them in common with the rest of the body not struck by these leaden missiles, which the natives of the Northwest coast, between the Straits of Fuca and the Aleutian Islands, undoubtedly used in attempting to capture the animal some season or seasons previously. A small number, not definitely known, however, are taken by the Indians every year along the coasts above mentioned, who surprise the seals while asleep in the water, either shooting or spearing them. The number captured in this way every year is probably less than seven or eight thousand; it cannot be great.

FUR SEALS HAULING ON ZOLTOI SANDS.

St. Paul's Island near the Village—The holluschukie parading—September 15, 1872.

The Government interests on these Islands represent the commercial value of twenty or twenty-five millions of dollars at least. The course which I have indicated in my chapter upon the management of the sealing business, of gradually increasing the killing of the surplus males, with careful watch for effect upon the rookeries, year after year, and, on the other hand, of watching the market so as not to overstock, will, I trust, be taken in hand very soon; but let this fact be noted—these animals are liable at any time to be terribly diminished in number by a visitation of plague or distemper, over which we can have no control, and to which they, like all other great congregations of animal life, as well as vegetable, are ever subject. This diminution[1] may run on for many years before they shall recuperate and increase to their normal number; this may not happen for an indefinite time to come, or it may be apparent next year; and for this reason especially I lay such stress upon the necessity of mapping out and jealously watching the breeding-grounds every season, so that the past year can be accurately compared with the present one.

The seals suffer no loss from natural foes while they are in the vicinity of the Islands; for were they disturbed by sharks, killers, &c., it would be observed. They meet with these enemies as they go south during the winter in the North Pacific. Should the weather, however, be stormy during the season that the pups begin to swim, the surf will drown thousands upon thousands of the awkward young animals. During the two seasons of my residence upon the Islands, the sea was quite calm, and no loss, of mention, was sustained by this class.

In concluding with the management of the sealing interests of the Government on these Islands, I would sum up the following from the foregoing statements and discussions, and respectfully urge your consideration:

First. To extend the time of taking seals as now fixed by law on the Islands, inasmuch as it is at present restricted without reason; instead of leaving it from the 1st of June to the 1st of August, *make it from the 1st of June to the 15th August.*

Second. That as the proportion of seal-life given to Saint George Island by the Government agent is incorrect, widely so, make the quota from this Island not more than 10,000, and take 90,000 from Saint Paul's Island, instead of 25,000 seals from the former and only 75,000 from the latter, as is now fixed by law, based upon incorrect information.

Third. That a regular augmentation of 10,000, and no more, seals be made every year to the number now fixed by law, and that this increase be made upon Saint Paul's Island, until it shall be deemed inexpedient to increase the killing

[1] This is well shown by Bishop Veniaminov's account in the Appendix, where it will be seen that, after the Russians had killed them without *regard to sex or system for thirty-one years, in yearly catches of* 80,000 *to* 90,000, *without causing any change in the ratio number of the masses*, in 1817 a diminution was observed, and steadily grew greater until the season of 1836, when scarcely a tithe of the former number appeared on the ground; but from that year the seals began to increase steadily in number up to 1842, when they again reached their maximum number, and at which they have remained. A variety of reasons or excuses have been given for this diminution, such as successive severe winters, &c.; but my impression is that as the animals then were selected hap-hazard on the breeding-grounds, males and females, that they slowly began to shun returning to the Islands year by year, seeking other land and there breeding; but as soon as the Russians began to respect the principle of never killing or driving the females, the animals gradually regained their confidence, and returned finally *en masse* to this the most eligible land for their occupation in the northern hemisphere. This was the reason for their diminution at this period, or they were suffering from the ravages of some plague or distemper not noticed by the people then.

by both the Government and the lessees. The condition of the rookeries on the one hand and that of the market for the raw material on the other will be the proper checks upon taking this additional number.

Fourth. That Government agents be placed upon the Islands who are competent to carry out the routine of observation and report which I have specified; for unless this step is taken by you immediately, the Government will be without reliable knowledge as to the importance and condition of its valuable interests on these Islands from year to year.

Fifth. On account of the isolated position of the Islands, rendering communication infrequent and risky, I deem it best that the agent in charge report personally every winter to you, (returning to the ground every spring, leaving his assistants there in the meanwhile,) so that he may report more fully, and take a prompt and intelligent stand before Congress in the case of any discussion there on these interests and their management, for questions might arise which would cause, perhaps, temporary trouble.

Sixth. *The annual waste of seal-oil.* Upon the Prybilov Islands 100,000 seals are annually slaughtered and the blubber suffered to rot and waste away upon the killing-grounds, owing to the tax now levied by law upon every gallon of seal-oil that may be made and exported to home ports. In this way over 40,000 gallons of excellent oil are annually lost to the aggregate of national wealth. As the matter now stands, no party can profitably render this seal-blubber into oil and transport it down, twenty-five hundred miles, to San Francisco, for market, and enter into competition there with the makers of lard, rape-seed, and other oils which have no such impost to support.

I would, therefore, respectfully suggest that, as this waste of seal-oil on the Prybilov Islands is a public loss, the tax now levied by law upon its shipment from the Islands to home ports be abolished.

Seventh. Who are the "natives" of the Prybilov Islands, *as specified by the law of the lease?* This is a matter of great importance to these people, and to prevent confusion and illegal action in the future, I earnestly urge the propriety of settling this question beyond any possibility of evasion or misapprehension, for, as the case now stands, it is not clear or explicit as to what class of the classes of people now living upon the Islands are "*the natives*," who are by law guaranteed, as they should be, the sole right of independent residence on the Islands and participation in the sealing labor and reward.

The people now living upon the Islands may be divided into three classes, viz:

1st. The *natives*, properly speaking, or those who have been born and raised there.

2d. The people who were living there, but not born upon the Prybilov Islands, at the time of the transfer of the Territory, June 20, 1867.

3d. The people who were living and working upon the Prybilov Islands at the time of the granting of the present lease, July 1st, 1870.

ENGLISH BAY.

The great hauling grounds of the Fur Seal, on the south shore of St. Paul's—Seen from Tolstoi Sand-dunes—July. 18, 1872.

If it is decided exclusively in favor of the *first* class, then three-fourths of the present population will be deprived of the right to live and labor upon the Islands.

If it is decided exclusively in favor of the *first* and the *second* classes, it will deprive six Kodiak and Aleutian families in the *third*, who have already intermarried with the natives, of the right to live and labor there, a loss which the people could not sustain well, as their working gang for the sealing business is none too large now, and many days, during the press of the best driving and killing season, they are short-handed.

But if it is decided also in favor of the *third* class, the matter will be settled in the most satisfactory manner, with regard to the wishes of the people themselves. An accurate record of the men, women, and children living upon the Islands at the time of the granting of the lease, can be found in the church-records on both Islands; a copy of the one on Saint Paul's I place in the Appendix, with annotations. The record in regard to Saint George's was in the custody of Father Shies-neekoff, at Ounalaska, and who was absent on the occasion of my being there, August, 1873.

Eighth. The brewing of beer or "*quass*" upon the Seal-Islands. The existing law which prohibits the importation, making, or selling of spirituous or fermented liquors in the Territory is an excellent one, but the natives can evade it almost everywhere, and do so, by brewing a species of beer from rice, sugar, flour, &c., with which they become intoxicated; but upon the Seal-Islands this law can be rigorously enforced, and it should be done rigidly, with honest regard for the best interests of the people there, who, had they the opportunity, would be in a chronic condition of drunken debauchery. This is only natural, as the greater part of their time is passed in idleness, owing to their position and the character of service they are called upon to render, which occupies them scarcely two months in the year.

The Government agent upon these Islands can quietly and effectually abate this existing nuisance of beer-intoxication by marking the offending persons and instructing the Company's agent, or, rather, authorizing him, to discontinue the selling of sugar, hops, &c., to the parties who abuse the privilege of purchasing them, and this agent will cheerfully do so. As matters now stand, the law is simply nothing, in regard to preventing the great evil of intoxication among these simple people, carried out as it has been by the agent in charge of the Islands during the season of my residence there, 1872–'73.

The physicians on the two Islands alone should have the dispensation of liquor, and they should be well supplied with it for medicinal use, but to all others living on the Islands the law should be patent and real.

Ninth. That an agent of the Treasury Department be commissioned to visit the Seal-Islands within Russian boundaries, in order that definite information concerning them shall be in the possession of the Department, so that the true value of our sealing-interests, compared with those of Russia, may be correctly known; and also that this agent be empowered to visit the large islands lying to the north of the Prybilov Group, in Bering Sea, now so little known, and to report upon the seal-life as he may find it there.

THE SEA-LION, (EUMETOPIAS STELLERI.)—"SEE-VITCHIE" OF THE ISLANDS.

This animal, although much below the fur-seal with reference to intelligence and physical organization, ranks next in natural order, and can, as well as its more sagacious and valuable relative, be seen to better advantage on these Islands than elsewhere, perhaps, in the world.

By looking at the plate, a glance will show at once the marked difference between this animal and the *Callorhinus*. It has a really leonine appearance and bearing, greatly enhanced by the rich, golden-rufous of its coat, ferocity of expression, and bull-dog like muzzle and cast of eye, not round and full, but showing the white, or sclerotic coat, with a light, bright-brown iris.

Although provided with flippers to all external view as the fur-seal, he cannot, however, make use of them in the same free manner. While the fur-seal can be driven five or six miles in twenty-four hours, the sea-lion can barely go two, the conditions of weather and roadway being the same. The sea-lions balance and swing their long, heavy necks to and fro, with every hitch up behind of their posteriors, which they seldom raise from the ground, drawing them up after the fore feet with a slide over the grass or sand, rocks, &c., as the case may be, and pausing frequently to take a sullen and ferocious survey of the field and the drivers.

The sea-lion bull of Bering Sea, when full-grown and in good condition, will measure off in length 11 to 12.5 feet from nose to tip of tail, (which is seldom over 3 or 4 inches long,) and girth 10. Unfortunately, I was not able to weigh one of these big bulls, and can, therefore, only estimate this weight at a thousand pounds, while, perhaps, some of the largest and finest old fellows will touch twelve to thirteen hundred; but I doubt it.

The sea-lion is polygamous, but does not maintain any such regular system and method in preparing for and attention to its harem like that so finely illustrated on the breeding-grounds of the fur-seal. It is not numerous, comparatively speaking, and does not "haul" more than a few rods back from the sea. It cannot be visited and inspected by man, being so shy and wary that on the slightest approach a stampede into the water is the certain result. The males come out and locate on the narrow belts of rookery-ground, preferred and selected by them; the cows make their appearance three or four weeks after them, (1st to 6th June,) and are not subjected to that intense jealous supervision so characteristic of the fur-seal harem. The bulls *fight* savagely among themselves, and turn off from the breeding-ground all the younger and weak males.

FUR SEALS "HAULING."

On the east shore of St. Paul's Island, between Tonkie Mees and Polavina Point—June 14, 1872.

The cow sea-lion is not quite half the size of the male, and will measure from 8 to 9 feet in length, with a weight of four and five hundred pounds. She has the same general cast of countenance and build of the bull, but as she does not sustain any fasting period of over a week or ten days, she never comes out so grossly fat as the male or "see-catch."

The *sea-lion rookery* will be found to consist of about ten to fifteen cows to the bull. The cow seems at all times to have the utmost freedom in moving from place to place, and to start with its young, picked up sometimes by the nape, into the water, and play together for spells in the surf-wash, a movement on the part of the mother never made by the fur-seal, and showing, in this respect, much more attention to its offspring.

Copulation is all done on the land, as in the case of *Callorhinus*, but is even more violent. I have timed but two cases, one ten minutes and the other fifteen. The cow remains entirely passive.

They are divided up into classes, which sustain, in a general manner, but very imperfectly, nearly the same relation one to the other as do those of the fur-seal, of which I have already spoken at length and in detail; but they cannot be approached, inspected, and managed like the other, by reason of their wild and timid nature. They visit the Islands in numbers comparatively small, (I can only estimate,) not over thirty or thirty-five thousand on Saint Paul's and contiguous islets, and not more than seven or eight thousand at Saint George. On Saint Paul's Island they occupy a small portion of the breeding-ground at Northeast Point, in common with the *Callorhinus*, always close to the water, and taking to it at the slightest disturbance or alarm.

The sea-lion rookery on Saint George's Island is the best place upon the Seal-Islands for close observation of these animals, and the following note was made upon the occasion of one of my visits, (June 15, 1873:)

"At the base of cliffs, over 400 feet in height, on the east shore of the Island, on a beach 50 or 60 feet in width at low water, and not over 30 or 40 at flood-tide, lies the only sea-lion rookery on Saint George's Island—some three or four thousand cows and bulls. The entire circuit of this rookery-belt was passed over by us, the big, timorous bulls rushing off into the water as quickly as the cows, all leaving their young. Many of the females, perhaps half of them, had only just given birth to their young, for some of them were still wet and entangled in the placental membrane. These pups will weigh at least 20 to 25 pounds on an average when born, are of a dark chocolate-brown, with the eye as large as the adult, only being a suffused, watery, gray-blue, where the sclerotic coat is well and sharply defined in its maturity. They are about 2 feet in length, some longer and some smaller. The placenta is quite large, and is expelled after the pup, generally very bloody, much more so than among the *fur-seals*. As all the pups seen to-day were very young, some at this instant only born, they were dull and apathetic, not seeming to notice us much. There are, I should say, about one-sixth of the sea-lions in number on this Island, when compared with Saint Paul's. As these animals lie here under the cliffs, they cannot be approached and driven; but should they haul a few hundred rods up to the south, then they can be easily

captured. They have hauled in this manner always until disturbed in 1868, and will undoubtedly do so again if not molested.

"These sea-lions, when they took to the water, swam out to a distance of fifty yards or so, and huddled all up together in two or three packs or squads of about 500 each, holding their heads and necks up high out of water, all roaring in concert and incessantly, making such a deafening noise that we could scarcely hear ourselves in conversation at a distance from them of over a hundred yards. This roaring of sea-lions, thus disturbed, can only be compared to the hoarse sound of a tempest as it howls through the rigging of a ship, or the playing of a living gale upon the bare branches, limbs, and trunks of a forest grove." They commenced to return as soon as we left the ground.

The voice of the sea-lion is a deep, grand roar, and does not have the flexibility of the *Callorhinus*, being confined to a low, muttering growl or this bass roar. The pups are very playful, but are most always silent. When they do utter sound, it is a sharp, short, querulous growling.

The Drive of the Sea-Lions on Saint Paul's Island.—The natives have a very high appreciation of the sea-lion, or *see vitchie*, as they call it, and base this regard upon the superior quality of the flesh, fat, and hide for making covers for their skin-boats, *bidarkies* and *bidarrahs*, sinews, intestines, &c.

As I have before said, the sea-lion seldom hauls back far from the water, generally very close to the surf-margin, and in this position it becomes quite a difficult task for the natives to approach and get in between it and the sea unobserved, for, unless this silent approach is made, the beast will at once take the alarm and bolt into the water.

By reference to my map of Saint Paul's, a small point, near the head of the northeast neck of the Island, will be seen, upon which quite a large number of sea-lions are always to be found, as it is never disturbed except on the occasion of this annual driving. The natives step down on to the beach, in the little bight just above it, and commence to crawl on all fours and flattened out on the sand, down to the end of the neck and in between the dozing sea-lion herd and the water, always selecting a semi-bright moonlight night. If the wind is favorable, and none of the men meet with an accident, the natives will almost always succeed in reaching the point unobserved, when, at a given signal, they all jump up on their feet at once, yell, brandish their arms, and give a sudden start, or alarm, to the herd above them, for, just as the sea-lions move, upon the first impulse of surprise, so they keep on. For instance, if the animals on starting up are sleeping with their heads pointed in the direction of the water, they keep straight on toward it; but if they jump up looking over the land, they follow that course just as desperately, and nothing turns them, *at first*, either one way or the other. Those that go for the water are, of course, lost, but the natives follow the land-leaders and keep urging them on, and soon have them in their control, driving them back into a small pen, which they extemporize by means of little stakes, with flags, set around a

FUR SEALS CLIMBING TOLSTOI CLIFFS.

St. Paul's Island—July 10, 1872.

circuit of a few hundred square feet, and where they keep them until three or four hundred, at least, are captured, before they commence their drive of ten miles overland down south to the village.

The natives, latterly, in getting this annual herd of sea-lions, have postponed it until late in the fall, and when the animals are scant in number and the old bulls poor. This they were obliged to do, on account of the pressure of their sealing-business in the spring, and the warmth of the season in August and September, which makes the driving very tedious. In this way I have not been permitted to behold the best-conditioned drives, *i. e.*, those in which a majority of the herd is made up of fine, enormously fat, and heavy bulls, some four or five hundred in number.

The natives are compelled to go to the northeast point of the Island for these animals, inasmuch as it is the only place with natural advantages where they can be approached for the purpose of capturing alive. Here they congregate in greatest number, although they can be found, two or three thousand of them, on the southwest point, and as many more on "See-vitchie Cammin" and Otter Island.

Capturing the sea-lion drive is really the only serious business these people on the Islands have, and when they set out for the task the picked men only leave the village. At Northeast Point they have a *barrabakie*, in which they sleep and eat while gathering the drove, the time of getting which depends upon the weather, wind, &c. As the squads are captured, night after night, they are driven up close by the *barrabakie*, where the natives mount constant guard over them, until several hundred animals shall have been secured, and all is ready for the drive down overland to the village.

The drove is started and conducted in the same general manner as that which I have detailed in speaking of the fur-seal, only the sea-lion soon becomes very sullen and unwilling to move, requiring spells of frequent rest. It cannot pick itself up from the ground and shamble off on a loping-gallop for a few hundred yards, like the *Callorhinus*, and is not near so free and agile in its movements on land, or in the water for that matter, for I have never seen the *Eumetopias* leap from the water, like a dolphin, or indulge in the thousand and one submarine-acrobatic displays made constantly by the fur-seal.

This ground, over which the sea-lions are driven, is mostly a rolling level, thickly grassed and mossed over, with here and there a fresh-water pond into which the animals plunge with great apparent satisfaction, seeming to cool themselves, and out of which the natives have no trouble in driving them. The distance between the sea-lion pen at Northeast Point and the village is about ten miles as the sea-lions are driven, and occupies over five or six days under the most favorable circumstances, such as wet, cold weather; and when a little warmer, or as in July or August, a few seasons ago, they were some three weeks coming down with a drove, and even then left a hundred or so along on the road.

After the drove has been brought into the village on the killing-grounds, the natives shoot down the bulls and then surround and huddle up the cows, spearing them just behind the fore-flippers. The killing of the sea-lions is quite an exciting spectacle, a strange and unparalleled exhibition of its kind; and I cannot do better than to refer directly and silently to my illustrations of it. The bodies are at once stripped of their hides and much of the flesh, sinews, intestines, (with which

the native water-proof coats, &c., are made,) in conjunction with the throat-linings, (*œsophagus*,) and the skin of the flippers, which is exceedingly tough and elastic, and used for soles to their boots or "*tarbosars*."

As the sea-lion is without fur, the skin has little or no commercial value; the hair is short, and longest over the nape of the neck, straight and somewhat coarse, varying in color greatly as the seasons come and go. For instance, when the *Eumetopias* makes his first appearance in the spring and dries out upon the land, he has a light-brownish, rufous tint, darker shades right back and under the fore-flippers and on the abdomen; by the expiration of a month or six weeks, 15th June, he will be a bright golden-rufous or ochre, and this is just before shedding, which sets in by the middle of August, or a little earlier. After the new coat has fairly grown, and just before he leaves the Island for the season, in November, it will be a light sepia, or vandyke-brown, with deeper shades, almost dark upon the belly; the cows, after shedding, do not color up so dark as the bulls, but when they come back to the land next year they are identically the same in coloration, so that the eye in glancing over a sea-lion rookery in June and July cannot discern any noted dissimilarity of coloring between the bulls and the cows; and also the young males and yearlings appear in the same golden-brown and ochre, with here and there an animal spotted somewhat like a leopard, the yellow rufous ground predominating, with large patches of dark-brown irregularly interspersed. I have never seen any of the old bulls or cows thus mottled, and think very likely it is due to some irregularity in the younger animals during the season of shedding, for I have not noticed it early in the season, and failed to observe it at the close. Many of the old bulls have a grizzled or slightly brindled look during the shedding period, or, that is, from the 10th August up to the 10th or 20th of November; the pups when born, are of a rich, dark chest-nut-brown; this coat they shed in October, and take one much lighter, but still darker than their parents, but not a great deal.

Although, as I have already indicated, the sea-lion, in its habit and disposition, approximates the fur-seal, yet in no respect does it maintain and enforce the system and regularity found on the breeding-grounds of the *Callorhinus*. The time of arrival at, stay on, and departure from the Island is about the same; but if the winter is an open, mild one, the sea-lion will be seen frequently all through it, and the natives occasionally shoot them around the Island long after the fur-seals have entirely disappeared for the year. It also does not confine its landing to these Prybilov Islands alone, as the fur-seal unquestionably does, with reference to our continent; for it has been and is often shot upon the Aleutian Islands and rocky islets of the northwest coast.

The sea-lion in no respect whatever manifests the intelligence and sagacity exhibited by the fur-seal, and must be rated far below, although next, in natural order. I have no hesitation in putting this *Eumetopias* of the Prybilov Islands, apart from the sea-lion common at San Francisco and Santa Barbara, as a distinct animal; and I call attention to the excellent description of the California sea-lion, made public in the April number for 1872 of the Overland Monthly, by Capt. C. M. Scammon, in which the distinguishing characters, externally, of this animal are well defined, and by which the difference

THE "HAULING GROUNDS" AT ENGLISH BAY.

Looking southeast over to Tolstoi Point, St. Paul's Island—("Holluschukie.")—July 18, 1872.

between the *Eumetopias* of Behring Sea and that of the coast of California can at once be seen; and, also, I notice one more point in which the dissimilarity is marked—the northern sea-lion never barks or howls like the animal at the Farralones or Santa Barbara. Young and old, both sexes, from one year and upward, have *only* a deep *bass growl* and *prolonged, steady roar;* while at San Francisco the sea-lions break out incessantly with a "honking" bark or howl, and *never roar.*

I am not to be understood as saying that *all* the sea-lions met with on the Californian coast are different from *E. stellui* of Behring Sea. I am well satisfied that stragglers from the north are down on the Farralones, but they are not migrating back and forth every season; and I am furthermore certain that not a single animal of the species most common at San Francisco was present among those breeding on the Prybilov Islands in 1872–'73.

According to the natives of Saint George, some fifty or sixty years ago the *Eumetopias* held almost exclusive possession of the Island, being there in great numbers, some two or three hundred thousand; and that, as the fur-seals were barely permitted to land by these animals, and in no great number, the Russians directed them (the natives) to hunt and worry the sea-lions off from the Island, and the result was that as the sea-lions left, the fur-seals came, so that to-day they occupy nearly the same ground covered by the *Eumetopias alone* sixty years ago. This statement is, or seems to be, corroborated by Choris, in his description of the "Iles S.-George's et S.-Paul's," visited by him fifty years ago;[1] but the account given by Bishop Veniaminov,[2] and placed in the Appendix, differs entirely from the above, for by it almost as many fur-seals were taken on Saint George, during the first years of occupation, as on Saint Paul, and never have been less than one-sixth of the number on the larger Island. For this the natives claim to have, on the one hand, proof as to the truth of their statement, and Father Veniaminov, on the other, publishes upon the credit of reliable lists and manuscripts in his possession at the time of writing. I am strongly inclined to believe that the Island of Saint George never was resorted to in any great numbers by the fur-seal, and that the sea-lion was the dominant animal there until disturbed and driven from its breeding-grounds by the people, who sought to encourage the coming of its more valuable relative by so doing, and making room in this way for it.

The sea-lion has but little value save to the natives, and is more prized on account of its flesh and skin, by the people living upon the Islands and similar positions, than it would be elsewhere. The matter of its preservation and perpetuation should be left entirely to them, and it will be well looked after. It is singular that the fat of the sea-lion should be so different in characters of taste and smell from that of the fur-seal, being free from any taint of disagreeable flavor or odor, while the blubber of the latter, although so closely related, is most repugnant. The flesh of the sea-lion cub is tender, juicy, light-colored, and slightly like veal; in my opinion, quite good. As the animal grows older, the meat is dry, tough, and without flavor.

[1] Voyage Pittoresque autour du Monde.

[2] Zapeeskie ob Ostrovah Oonahlashkenskaho Otdayla, St. Petersburgh, 1840.

THE WALRUS OF BEHRING SEA, ROSMARUS ARCTICOS.

I write "the walrus of *Behring Sea*," because this animal is quite distinct from the walrus of the North Atlantic and Greenland, differing from it specifically in the most striking manner.

These clumsy beasts are, at the present time, only to be seen on Walrus Island, being so shy and timid that they have deserted the other Islands as they were populated by man. In early days, or when the Russians first took possession, a great many walrusses were found at Northeast Point and along the south shore of Saint Paul's Island, but with the landing of the traders and seal-hunters the walrus abruptly took its departure, and Walrus Island alone is now frequented by it, being isolated and seldom visited during the year by the natives.

It is of small commercial importance; the ivory is of poor quality, porous, pithy, and yellow, while the oil is of a low grade, and the hide is quite valueless. But it is the main support of the Esquimaux far to the north, where it breeds upon the ice, the females never coming down to the Prybilov Group, only males are to be seen on Walrus Island.

On this little Island I have enjoyed a fine opportunity of studying and painting these uncouth animals from life, being able to easily approach to within a slight distance from the flanks of a herd of over five hundred walrus bulls, which laid closely packed upon a low series of basaltic tables, elevated but little from the surf-wash. I sat upon a small rocky ledge only a feet above, and over, four or five heavy bulls, being, however, on the leeward side.

I was surprised to observe the raw, naked appearance of the hide, a skin covered with a multitude of pustular-looking warts and pimples, without hair or fur, deeply wrinkled with dark red venous lines, showing out in bold contrast through the thick, yellowish-brown cuticle, which seemed to be scaling off in places, as if with leprosy. They struck my eye at first in a most unpleasant manner, for they looked like bloated, mortifying, shapeless masses of flesh; the clusters of swollen warty pimples, of a yellow parboiled flesh-color, over the shoulders and around the neck suggested unwholesomeness forcibly.

This walrus is sluggish and clumsy in the water and is almost helpless on the rocks out of it, and can no more move

SEAL BREATH FOG.

Passing through the Seals on a tour of inspection—Reef Parade-grounds, St. Paul's Island—October 10, 1872.

on land, like even the lowest of the seals, *Phoca*, than can the hippopotamus run with the antelope; the immense bulk and weight compared with the size and strength of its limbs renders it quite impotent for terrestrial movement. Like the seal, it swims entirely under water when traveling, not rising, however, quite so frequently to breathe, when it "blows" not unlike a whale. On a cool, quiet morning in May, I watched a herd off the east coast of the Island, tracing its progress by the tiny jets of vapor thrown off as the animals rose to respire.

The adult male is about 12 feet in length from nostrils to tip of tail and has 10 or 12 feet of girth, and one bull, shot by the natives on Walrus Island, July 5, 1872, was nearly 13 feet long, with the enormous girth of 14 feet. The immense mass of blubber on the shoulders and around the neck makes the head and posteriors look small in proportion and attenuated.

The strange flattened appearance of the head will be better understood by reference to the plate, where the nostrils, eyes, and ear spots seem to be nearly placed on top of the head, the nasal apertures especially so, opening directly over the muzzle, oval, and about an inch in their greatest diameter.

The tusks, or canines, are set firmly under the nostril apertures, in a deep, massive, bony pocket, giving a broad, square-cut front to the muzzle. They grow down, varying in size and weight from 8 or 10 inches in length to over 2 feet, and from five pounds to fifteen, usually bowed out somewhat in the middle, the ends approaching quite closely. The larger tushes have a diameter at the heel of a little more than $2\frac{1}{2}$ inches, tapering down to less than half an inch at the tip.

The upper lips are thick and gristly, full of short, stubbed, gray-white bristles, from one-half to three inches long. There are a few bristles set, also, on the chin of the lower jaw.

The eyes are small, but prominent, set very nearly on top of the head, protruding from their sockets like those of the lobster. They are rolled about in every direction when the animal is startled. The iris and pupil is less than one-fourth of the exposed surface; the sclerotic coat bulges out from the lids, and is of a dirty, mottled coffee-yellow and brown, with an occasional admixture of white; the iris, light-brown, with dark-brown rays and spots. The animal has the power to roll the eyes when aroused, seldom moving the head more than to elevate it; but the range of sight out of water is not well developed, at least, for, after throwing small chips of rock down upon the walrus bulls near me, causing only a stupid stare and low grunts of astonishment, I rose gently and silently to my feet, and stood boldly up before them, not more than ten feet away, but I was not noticed; had I, however, given them a little noise, or had I been standing hundreds of yards away from them, to the windward, they would have taken the alarm instantly, and tumbled off into the sea like so many hustled wool-sacks, for their sense of smell is keen.

The ears of the walrus are on the same line at the top of the head with the nostrils and eyes, the latter being mid-way between. The *pavilion* is a slight fleshy wrinkle, or fold, not at all raised or developed, and from what I could see of the *meatus externus*, it was very narrow and small, but they are quick and sensitive in hearing.

The head of the walrus male, full grown, is, on an average, 18 inches long between the nostrils and the post-occipital region, and weighs from sixty to eighty pounds. I can only estimate the gross-weight of a mature, well-conditioned bull at two thousand pounds. The skin alone weighs from two hundred and fifty to four hundred pounds. It is two and three inches thick on the shoulders and around the neck, and nowhere less than half an inch deep.

It feeds exclusively upon shell-fish (*Lamellibranchiata*, or clams, principally) and the bulbous-roots of certain marine grasses and plants, which grow in great abundance in the many broad, shallow lagoons and bays of the main-land coast. I have taken from the paunch of a walrus over a bushel of crushed clams, shells and all, which the animal had but recently swallowed, since digestion had scarcely commenced. Many of the clams in the stomach were not even broken; and it is in digging these shell-fish that the service rendered by the enormous tushes becomes evident.

In landing and climbing over the low rocky shelves at "Morserovia," this animal is almost as clumsy and indolent as the sloth; they crowd up from the water, one after the other, in the most ungainly manner, accompanying their movements with low grunts and bellowings; the first one up from the sea no sooner gets composed upon the rocks for sleep than the second one comes prodding and poking with its blunted tusks, demanding room also, and causing the first to change its position to another still farther off from the water; and the second is in turn treated in the same way by the third, and so on, until hundreds will be packed together on the shore as thickly as they can lie, frequently pillowing their heads or posteriors upon the bodies of one another, and not at all quarrelsome; as they pass all time when on land in sluggish basking or deep sleep, they seem to resort to a very singular method of keeping guard, if I may so term it, for in this herd of three or four hundred bulls under my eye, though all were sleeping, yet the movement of one would disturb the other, which would raise its head in a stupid manner, grunt once or twice, and before lying down to sleep again, in a few moments, it would strike the slumbering form of its nearest companion with its tusks, causing that animal to rouse up for a few minutes also, grunt and pass the blow on to the next in the same manner, and so on, through the whole herd; this disturbance among themselves always kept some one or two aroused, and consequently more alert than the rest.

In moving on land they have no power in the hind limbs, which are dragged and twitched up behind; progression is slowly and tediously made by a succession of short steps forward on the fore-feet. How long they remain out from the water at any one time I am unable to say. Unlike the seals they breathe heavily and snore.

The natives told me that the walrus of Behring Sea is monogamous, and that the difference between the sexes in size, color, and shape, is inconsiderable; that the female brings forth her young, a single calf, in June, usually on the ice-floes in the Arctic Ocean, above Behring Straits; that the calf closely resembles the parent in general proportions and color, but that the tusks which give it its most distinguishing expression are not visible until the end of the second year of its life; that the walrus mother is strongly attached to her offspring, and nurses it later in the season in the sea; that the walrus

CAPTURING FUR SEALS.

Natives running in between them and the water, turning them back upon the land—English Bay, St. Paul's Island—June 10, 1872.

sleeps profoundly in the water, floating almost vertically, with barely more than the nostrils above water, and can be easily approached if care is taken, to within easy spearing distance; that the bulls do not fight as savagely as the fur-seal or sea-lion, the blunted tushes of the combatants seldom penetrate the thick hide; that they can remain under water nearly an hour, or about twice as long as the seals, and that they sink like so many stones immediately after being shot.

These animals are seldom molested on Walrus Island, the natives not making any use of their flesh, fat, or hides; and when they are shot, it is usually but a wanton undertaking by the people while visiting the Island in June and July. For the purpose of getting eggs, the natives come from the village on Saint Paul's twice or thrice every year, and only at this season.

DRIVING FUR SEALS.

The drove crossing Zoltoi Sands, St. Paul's Island—June 14, 1872.

APPENDIX.

FUR SEALS ON THE ROAD.

A "drive" crossing the Lagoon Flats, St. Paul's Island—July 20, 1872.

THE PRYBILOV ISLANDS.[1]

"Under the name of the *Prybilov Islands* are known two small Islands lying in Behring Sea, between 56° and 57° north latitude and 168° and 170° west longitude.

"These Islands were not known before the year 1786; mate *G. Prybilov*, then in the service of a swan-hunting company, first, in the Russian name, found them, but, at the same time, he was not the first discoverer, because, as before said, (Part I, Chap. 1,) on one of them (southwest side of Saint Paul) signs, such as a pipe, brass knife-handle, and traces of fire, were found, indicating that people had been there before, but not long, as places were observed where the grass had been burned and scorched. But, if we can believe the Aleuts in what they relate, the Islands were known to them long before they were visited by the Russians. They knew and called them '*Ateek*' after having heard about them.

"Eegad-dah-geek, a son of an Oonimak chief by the name of Ah-kak-nee-kak, was taken out to sea in a *bidarkee* by a storm, the wind blowing strong from the south. He could not get back to the beach, nor could he make any other landing, and was obliged to run before the wind three or four days, when he brought up on Saint Paul's Island, north from the land which he had been compelled to leave. Here he remained until autumn, and became acquainted with the hunting of different animals. Elegant weather one day setting in, he saw the peaks of Oonimak. He then resolved to put to sea, and return to receive the thanks of his people there; and, after three or four days of traveling, he arrived at Oonimak, with many otter tails and snouts.[2]

"The Islands were both at first without vegetation, with exception of Saint Paul's, where there was a small *tal-neek* creeping along on the ground; and on Saint George, if we believe the accounts of the first ones there to see, nothing grew,

[1] Translated by the writer from Bishop Innocent Veniaminov's work ZAPEESKIE OB OCTROVAH OONAHLASHKENSKAHO OTDAYLA. St. Petersburg, 1840. (The only Russian treatise upon the subject found. Only *selections most pertinent* to the subject are introduced in this translation.)

[2] Here Veniaminov says that he does feel inclined to believe this story, as the peaks of Oonimak can be seen occasionally from Saint Paul's! I have no hesitation in saying that they were never observed by any mortal eye from the Prybilov Group. The wide expanse of water between these points, and the thick, foggy air of Behring Sea especially so at the season mentioned in this story above, will always make the mountains of Oonimak invisible to the eye from Saint Paul's Island.

even grass, except on the places where the carcasses of dead animals rotted. In the course of time both Islands were covered with grass, a great part of it being of the sedge kind. On them are two varieties of berries," &c., &c.

"The Aleuts serving the Company here sustained the following relations between themselves and it, to wit: each of them worked without solicitation and at whatever was found, and to which they were directed, or that which they understood. Payment for their toil was not established by the day or by the year, but, in general, for each thing taken by them or standing or put to their credit by the Company; for instance, especially, the skins of animals, the teeth of walrus, barrels of oil, &c. These sums, whatever they might be, were placed by the Company to their credit, for all general hunting and working was established or fixed for the whole year fairly. The Aleuts, in general, received no specific wages, though they were not all alike or equal, there being usually three or four classes.

"In these classes, to the last or least, the sick and old workmen were counted in, although they were only burdens, and therefore they received the smaller shares, about 150 roubles, and the other and better classes received from 220 to 250 roubles a year. Those who were zealous were rewarded by the Company with 50 to 100 roubles. The wives of the Aleuts, who worked only at the seal-hunting, received from 25 to 35 roubles.[1]

"*Animals on the Prybilov Islands.*—Foxes and mice. Sometimes the ice brings bears and red foxes. The bears were never allowed to live, since they could not be made useful; and, also, the red foxes, as they would only spoil the breed already existing, with regard to color of the fur.

"Fur-seals, sea-lions, hair-seals, and a few walrus are the only animals that may be said to belong to the Prybilov Islands.

"*Birds.*—The *guillemonts*, (or *arries;*) gulls; puffins; crested, horned, and white-breasted auks; snow-finches; geese, (two kinds;) a few kinds of *Tringa;* sea-ducks, black and gray. Most of these birds come here to lay, and with them *jagers*, hawks, owls, and '*chikees*,' (big *Larus glaucus*,) and the albatross is frequently to be seen around the beaches."

"*Sea-otters* became quite extinct in 1811, and in the next thirty years entirely so.

"*The fur-seals* ('sea-cats') astonish us by their great numbers, as they gradually come up on to their breeding-places, notwithstanding harsh and foolish treatment of them, continued almost half a century (until 1824) without mercy.

"In the first years, on Saint Paul's Island from 50,000 to 60,000 were taken annually, and on Saint George from 40,000 to 50,000 every year. Such horrible killing was neither necessary nor demanded. The skins were frequently taken without any list or count. In 1803, 800,000 seal-skins had accumulated, and it was impossible to make advantageous sale of so many skins, for in this great number so many were spoiled that it became necessary to cut or throw into the sea 700,000

[1] Compare this annual payment made by the Russians with the cash settlement made every year by the Alaska Commercial Company, the present lessee of these Islands—presented in this Appendix.

SEALING GANG AT WORK.

Killing Fur Seals near the Village, St. Paul's Island—July 4, 1872.

pelts! If G. Rezanzov (our minister to Japan) had not given this his attention, and put himself between the animals and this foolish management of them, it appears plainly to me that these creatures would have long ago changed for the worse.

"Of the number of skins taken, up to 1817, I have no knowledge to rely upon, but from that time, and up to the present writing, I have true and reliable accounts, which I put in the appendix to this volume. From these lists it will be seen that still in 1820, on both Islands, there were killed more than 50,000 seals, viz, on Saint Paul's, 39,700; and on Saint George, 10,250. There were eye-witnesses to the reason for this diminution of the seals, and it is only wonderful, besides, that they are still existing, as they have been treated almost without mercy so many years. The cows produce only one pup each every year. They have known deadly enemies, and also are still exposed to many foes unknown. From this killing of the seals they steadily grew less, except on one occasion, which was on Saint George's Island, where an opportunity was given suddenly to kill a large number; but the circumstances do not seem to be important. On one occasion a drive was made of 15,000 male and female seals, but the night was dark, and it was not practicable to separate the cows from the males; and they were, therefore, allowed to stand over until daylight should come. The men put in charge of the herding of the drove were careless, and the seals took advantage of this negligence, and made an attempt to escape by throwing themselves from the bluffs over the beach, near by, into the sea; but, as this bluff was steep, high, rough, and slippery, they fell over and were all injured. Now, for the first time, great numbers of seals were missed, and why, it was not significant or apparent; but on the following year, instead of the appearance and catch of 40,000 or 50,000, less than 30,000 were killed and taken, and then, too, the numbers of seals were known to diminish, and in the same way, only greater, on the other Island. For instance, in the first years, on the Island of Saint George, the seals were only five or six times less than on Saint Paul, but in 1817 they were only less than one-fourth; but in 1826 they were almost one-sixth again.

"The diminution of seals there (Saint Paul's) and on the other Island, from 1817 to 1835, was very gradual and visible every year, but not always equal.

"The killing of seals in 1834, instead of being 80,000 or 60,000, was only 15,751 from both Islands, (Saint Paul, 12,700; Saint George's, 3,051.")

In the first thirty years, according to Veniaminov's best understanding, there were taken "*more than two and a half millions of seal-skins;*" then, in the next twenty-one years, up to 1838, they took 578,924. During this last taking, from 1817 to 1838, the skins were worth, on an average, "no more than 30 roubles each," ($6 apiece.)

"A great many sea-otters (*Lutra marina*) were found on Saint Paul's Island at first, and as many as 50,000 were taken from the Island, but years have passed since one has been seen in the vicinity, even, of the Islands."

NOTE.—I have given these extracts from Bishop Veniaminov's work upon Aleutian Islands, so as to show how much

the Russians really did know of these important interests, then in their sole charge, and how they managed them in early times. This work of Father Veniaminov will be found exceedingly valuable to the ethnologist, and is, perhaps, the only reliable treatise upon the Aleutians, their manners and customs, that has ever been written; and, as these people have virtually lost their identity, the book has, in my eyes, an enhanced value. But the discussion of Father Veniaminov upon the habits and disposition of the fur-seal, which is too verbose for insertion here, is very weak and incorrect.

Table I, Part II, Bishop Veniaminov's Zapeeskie, &c., showing the seal-catch during the period of gradual diminution of life on the Islands from 1817 *down to* 1836, *the year of scarcity, and from which date they have as gradually increased up to the present number, their maximum limit in a state of nature, at which the seal-life has stood during the past twenty years; the killing has also been gradually increased up to the present figure,* 100,000 *annually.*

Taken from—	1817.	1818.	1819.	1820.	1821.	1822.	1823.	1824.	1825.	1826.	1827.
Saint Paul's Island	47,860	45,932	40,300	39,700	35,750	28,150	24,100	19,850	24,600	23,250	17,750
Saint George's Island	12,328	13,924	11,924	10,520	9,245	8,319	5,773	5,550	5,500	(*)	*1,950
Total	60,188	59,856	52,225	50,220	44,995	36,469	29,873	25,400	30,100	23,250	19,700

Taken from—	1828.	1829.	1830.	1831.	1832.	1833.	1834.	1835.	1836.	1837.
Saint Paul's Island	18,450	17,150	15,200	12,950	13,150	13,200	12,700	4,052	4,040	4,220
Saint George's Island	4,778	3,661	2,834	3,084	3,296	3,212	3,051	2,528	2,550	2,582
Total	23,228	20,811	18,034	16,034	16,446	16,412	15,751	6,580	6,590	6,802

* Left to breed.

Grand total for Saint Paul's Island	464,259
Grand total for Saint George's Island	114,665
Total catch during nineteen years of diminution	578,924

THE SEA-LION OF BEHRING SEA.

Adult male—St. Paul's Island—November 18, 1872.

Table showing the weight, size, and growth of the fur-seal, (Callorhinus ursinus,) from the pup to the adult, male and female.

(The weights and measurements were taken by Mr. Samuel Falconer and the writer, on the killing-grounds at Saint George's Island, in 1873.)

Age.	Length.	Girth.	Gross weight of body.	Weight of skin.	Remarks.
	Inches.	*Inches.*	*Pounds.*	*Pounds.*	
One week	12 to 14	10 to 10½	6 to 7½	1¼	A male and female, being the only ones of this class handled.
Six months	24	25	39	3	A mean of ten examples, males and females alike in size.
One year	38	25	39	4½	A mean of six examples, males and females alike in size.
Two years	45	30	58	5½	A mean of thirty examples, all males, July 24, 1873.
Three years	52	36	87	7	A mean of thirty-two examples, all males, July 24, 1873.
Four years	58	42	135	12	A mean of ten examples, all males, July 24, 1873.
Five years	65	52	200	16	A mean of five examples, all males, July 24, 1873.
Six years	72	64	280	25	A mean of three examples, all males, July 24, 1873.
Eight to twenty years.	75 to 80	70 to 75	400 to 500	45 to 50	An estimate only, calculating on their weight when fat, and early in the season.

The females, adults, will correspond with the three-year-old males in the above table, the younger cows weighing frequently only 75 pounds and many of the older ones going as high as 120, but an average of 80 to 85 pounds is the rule.

The five and six year old males, when they first make their appearance in May and June, are very much heavier than at the time I weighed them in July; they are then, perhaps, when fat and fresh, fully one-third heavier than the exhibit on the table, but the cows and other classes do not sustain protracted fasts, and do not vary much through the season.

INHABITANTS OF SAINT PAUL, JULY 1, 1870, TAKEN FROM PHILLIP VOLKOV'S LISTS, AUGUST 8, 1873.

The names in *italics* are either dead or absent from the Island at the present writing.

1. *Phillip Keemachneek.*
2. *Effroseenia, his wife.*
3. *Ivan, his son.*
4. *Danelo, his son.*
5. Vasseele Seedoolee.
6. *Mareena, his wife.*
7. *Alexsander, his son.*
8. *Sylvester, his son.*
9. *Eefeem Anoolanak.*
10. *Matroona, his wife.*
11. *Simeon, adopted son.*
12. *Marka Aveelyah*
13. *Feeleechat, his wife.*
14. Peter Peeshenkov.
15. Matroona, his wife.
16. Ivan Eemanov.
17. Anna, his wife.
18. Yeagor, his son.
19. Loobov, his step-daughter.
20. Maxseem, his step-son.
21. Maria, his niece.
22. Nickolai Krukov.
23. Peter Krukov.
24. Agrafeena, his wife.
25. Ivan Korchooteen.
26. Ooleeana, his wife.
27. Yahkov Koochootin.
28. Lookahria, his sister.
29. *Natalia Makooleena.*
30. Maria Paranchina.
31. Keesar Shabbylean.
32. Agrafeena, his wife.
33. Neekon, his son.
34. *Ripsimia Plottnikova.*
35. Avdotia, her daughter.
36. Prokoopee Meeseekin.
37. Eveduxsia, his wife.
38. Avdotia Meeseekina, his step-mother.
39. Anna, daughter of Meeseekin.
40. Deemeetree Veatkin.
41. Evelampia Veatkin.
42. Balakshin, (Benedict.)
43. Matroona, his wife.
44. Meexhae, his son.
45. Balakshin, 2d, (Benedict.)
46. Stepan Krukov.
47. Natalia, his wife.
48. Avdokia Seeribneekova, (widow.)
49. Timofay, her son.
50. Olga, her daughter.
51. Paraskeevee, her daughter.
52. Akooleena, her daughter.
53. Michael Barrhov.
54. Malania, his wife.

NATIVES CREEPING UP ON THE SEA-LIONS

In order that they may get in between them and the water—Sea-lion Neck, St. Paul's Island—November 18, 1872.

55. Agnes, his daughter.
56. Daniel, his nephew.
57. Avdotia Schepeteenah, (widow.)
58. Tahreentee, her son.
59. Elarie, her son.
60. Hee-une-iah, her daughter.
61. Kerick Booterin.
62. Seeg-lee-teekiah, his wife.
63. *Patalamon, his son.*
64. Kerick, his son.
65. Salomayee, his daughter.
66. Ooleeta, his daughter.
67. George Booterin, his son.
68. Carp Booterin.
69. Lookariah Booterin.
70. Alexander Pancov.
71. Porfeerie, his son.
72. Avdotia, his step-daughter.
73. Paraskeevie, his step-daughter.
74. Yakov Sootyahgin.
75. Eeroadea, his wife.
76. Feedosayee Saydeek.
77. Anesia, his wife.
78. Anna, his daughter.
79. Feoktista, his god-mother.
80. Dayneese Saydeek.
81. *Baiz-yahzeekov, (Evlampia.)*
82. *Anna, his wife.*
83. *Maria, his daughter.*
84. Maroon Nakock.
85. Paraskeevie, his wife.
86. Zachar, his step-son.
87. ———, Nephew.
88. Paraskeevie, niece.
89. Natalia Habaroova.
90. Pavel Habarov, her son.
91. *Paul Shies-neekov, (Priest.)*
92. *Meeh-ah-elo, his son.*
93. Meeloveedova, Alexsandra, (widow.)
94. Simeon, her son.
95. *Alexsandra, her daughter.*
96. Antone, her son.
97. Marcia, her daughter.
98. Kerick Artamanov.
99. Olga, his wife.
100. Melania, his daughter.
101. Vasseleesee, his daughter.
102. Kah-sayn-yah, his daughter.
103. Gearman Artamanov.
104. Anna Tarantayvah, (widow.)
105. Anna, her daughter.
106. Stepan Bayloglazov.
107. Yealeena, his wife.
108. *Sayrgee, his son.*
109. Anna, his daughter.
110. Paraskeevie, his adopted girl.
111. Ermolie Cushing.
112. Faokla, his wife.
113. Faokla, his daughter.
114. Oolyahnah, his daughter.
115. Aggie Cushing, his son.
116. Antone Sootyahgen.

117. Oolyahnah, his wife.
118. Meetrofan, his son.
119. *Meehaie, his son.*
120. Yahkov Mandrigan.
121. Afanashia, his wife.
122. *Lookayleean, his son.*
123. Maria, his daughter.
124. Oseep Pahomov.
125. Varvarah, his wife.
126. Maria Seedova, (widow.)
127. Ahkakee, her son.
128. ———, daughter.
129. ———, daughter.
130. ———, daughter.
131. ———, daughter.
132. Alexsayee Neederazov.
133. Akooleena, his wife.
134. Christeena, his daughter.
135. Agrafeena, his daughter.
136. Keer Saydeek.
137. Yealeena, his wife.
138. *Maria, his daughter.*
139. Ivan Mandrigan.
140. Tatahyahn, his wife.
141. Vasseelee, his son.
142. Marfa, his daughter.
143. Feelat Teetov.
144. Peter, his son.
145. Yeaon, his son.
146. Yeagor Arkashav.
147. Alexsandra, his wife.
148. Martin, his step-son.
149. Nekolaie, his step-son.
150. Stepan, his step-son.
151. Kereek, his son.
152. Arsaynee, his son.
153. Tatayahnah, his daughter.
154. Timofay Evanov.
155. Fevronia, his daughter.
156. Paymen Kooznitzov.
157. Oseep Baizyahzeekov.
158. Alexsandra, his wife.
159. Paul, his son.
160. Kahsaynyah, his step-daughter.
161. Avdokia, his step-daughter.
162. *Kahsaynyah, his daughter.*
163. *Ivan Paranchin.*
164. Zaharrov Evemainov.
165. Keereenayah, his wife.
166. Fevronia, his daughter.
167. Ivan Hapov.
168. Anna, sister-in-law.
169. *Alexsandra, his daughter.*
170. Ivan, his son.
171. Yeagor Korchootin.
172. Zachar Saydeek.
173. Oosteenia, his wife.
174. Vasseelee, his son.
175. Marvra, his daughter.
176. *Nekon, his nephew.*
177. Feelip Saydeek.
178. Stepan Skahvortsov.

CAPTURING THE SEA-LIONS.

Springing the alarm—Sea-lion Neck, St. Paul's Island—November 18, 1872.

179. Phillip Vollkov.
180. Ellen, his daughter.
181. Matroona, his daughter.
182. Markiel Vollkov, his son.
183. Gavreelo Korchurgin.
184. Lukaylean, his son.
185. *Ivan Sootyahgen.*
186. Heeyoniah, his wife.
187. Aneesia, his daughter.
188. Emelian Sootyahgen.
189. Marko Korchootin.
190. Dareyah, his wife.
191. Ivan, his son.
192. Zeenovia, his daughter.
193. Timofay Glottov.
194. Maria, his wife.
195. ———, *his son.*
196. Ivan, his son.
197. Yeafeemia, his daughter.
198. Iraklin Mandrigan.
199. Oosteenie, his wife.
200. Eeon, his son.
201. Paul Soovorrov.
202. Vassa, his wife.
203. ———, *his son.*
204. Akyleena, his mother.
205. *Agrafeena, (his adopted girl.)*
206. Eefeem Korchootin.
207. Palahgayee, his wife.
208. *Peter, his son.*
209. Luka Mandrigan.
210. Eereena, his wife.
211. Neekeeta Yitchmainov.
212. Christeena, his daughter.
213. Domenah, his daughter.
214. Taheesah, his daughter.
215. Ivan Yitchmamov.
216. Michael Korzerov.
217. Alexsandra, his wife.
218. Stepan Korzerov.
219. Paul Korzerov.
220. *Ivan Kozlov.*
221. Palahgayah, his mother.
222. Feodor, her son.
223. *Eveduckea, her daughter.*
224. Platone Tarakanov.
225. Marfa, his wife.
226. *Akoolena, his mother.*
227. Kerick Tarakanov.
228. Domian M. Kok, (John Frater.)
229. Oolyahnah, his wife.
230. Anna, his daughter.
231. Salomayah, Artomanov's daughter.

White men in charge.

1. Dr. McIntyre.
2. H. W. McIntyre.
3. Dr. Cramer.
4. *John M. Morton.*
5. Chas. Bryant.
6. D. Webster.
7. ——— ———, *a cooper.*
8. ——— ———, a carpenter.

Annual division or cash settlement made by the natives on Saint Paul's Island, among themselves, the proceeds of their work in taking and skinning 75,000 *seals, at* 40 *cents per skin,* $30,000, *with extra work connected with it, making* $30,637.37.

Seventy-four shares, proportioned as follows:

December 31, 1872.—37 first-class shares, at	$451	22 each.
23 second-class shares, at	406	99 each.
4 third-class shares, at	360	97 each.
10 fourth-class shares, at	315	85 each.

The shares do not represent more than forty-five able-bodied men.

Annual division or cash settlement made by the people on Saint George's Island, among themselves, the proceeds of their work in taking and skinning 25,000 *seals, at* 40 *cents per skin,* $10,000.

August 1, 1873.—17 shares, each 961 skins, or $384.40	$6,294	80
2 shares, each 935 skins, or $374	748	00
3 shares, each 821 skins, or $328.40	985	20
1 share, 820 skins, or $328	328	00
3 shares, each 770 skins, or $308	924	00
3 shares, each 400 skins, or $160	480	00

Twenty-nine shares, or the twenty-nine laboring sealers; of this number two are women. Only twenty-five of them are able-bodied men.

The divisions above are the result of their own choice. They make this apportionment among themselves without advice or suggestion from the agents of the Company. These people have $3,320 on interest in the office of the Alaska Commercial Company at this date, and have credit on the books for $31,800; and when the division is made up on Saint Paul's at the regular annual time of settlement in December, $30,000 will be added to the above exhibit.

The people here are occupying, rent-free at the present time, eighteen frame houses built by and belonging to the Alaska Commercial Company on Saint Paul's Island. Eleven of these houses are new frame, 11 by 20 feet.

SHOOTING SEA-LION BULLS.

Herd driven down to the Village from North East Point, 10 *miles—St. Paul's Island—November* 28, 1872.

Notes on the value and market for fur-seal skins.

I regard the fur of the *Callorhinus* as an article oriental in value, for no matter whatever may be the whims of fashion in regard to style of wearing furs, it is, in itself, of intrinsic worth and will always, like silk, be in steady demand. It wears longer without injury than any other fine fur, and it can be dyed to any firm, bright color desired.

I do not think it in the power of the lessees to raise the price of the raw material much above their present selling-rates, which range from $5 to $9 per skin, according to quality and size. To gain this price they are obliged to ship their whole stock over to London and sell it there, not being able to so profitably dispose of it in this country. But the labor of dressing and dyeing raises the rate immensely, so that the skins, when they come out from the dressing-factories into the furrier's hands, are held at from $15 to $40 each, a great advance on the price of the raw material.

All articles of luxury, however, in dress, &c., such for instance as these furs, are governed by a certain limit in value which is assigned to them by the well-to-do people all over the world, who create and sustain the demand for them; but when an attempt is made to exceed or pass these points by the suppliers, the demand ceases.

I am not familiar with the process by which the raw skin is plucked, dressed, and dyed for market—it is a secret held by a few parties in London and one in this country—but I am credibly informed that the labor is very tedious and requires great mechanical skill, taking over two months of time to pass a skin through the different processes which are required for its finished state. This expenditure of skilled labor and time may perhaps justify the selling-price of the dealers, above quoted.

The Alaska Commercial Company, in reply to a query of mine as to the practicability and advantage of their taking the whole business, both of dressing seal-skins as well as supplying the raw material, state that it covers more ground than they are willing to undertake to manage, inasmuch as the present operations of the firm involve all the risk that they feel competent to assume, *provided that it were expected, by this step on their part, to have the effect of making the dressed fur cheaper.*

ORNITHOLOGY OF THE PRYBILOV ISLANDS.

BY DR. ELLIOTT COUES, U. S. A.

(Based on Mr. H. W. Elliott's manuscripts and collections.)

Mr. Elliott's manuscripts and specimens having been submitted to us for elaboration in the present connection, an account of the birds of the Islands is herewith rendered. His collections furnish the data for most of the technical portions of the memoir, while the biographical notices are, in substance, his own; these are placed between quotation marks. The nomenclature and sequence of the species are adapted to the present paper from the latest systematic work upon American Ornithology, the author's "Key to North American Birds," in which may be found a diagnosis of each species and variety not herewith described. The numeral prefix of each species is that which it bears in the author's "Check-List of North American Birds."

With the scientific names are given the English, and, in general, the Russian equivalents—the latter between quotation marks. In most cases the synonyms and references of special pertinence are added.

GENERAL REMARKS ON THE BIRDS OF THE ISLANDS.

"While a few species of water-fowl come to these Islands in innumerable numbers for the purpose of breeding, yet the list of birds to be met with here is a small one. It is, however, of exceeding interest to the naturalist, comprising many *desiderata* scarcely obtainable elsewhere.

"Over fifteen miles of the bold, high, basaltic, bluff shore-line of Saint George's Island is fairly covered with hundreds of thousands of nesting gulls *(Rissa)* and arries *(Uria,)* while down in the countless chinks and holes over the entire surface of the north side of this Island millions of 'chooch-kies' *(Simorhynchus microceros)* breed, filling the air and darkening the light of day with their cries and fluttering forms. On Walrus Island the nests of the great white gull of the north *(Larus glaucus)* can be visited and inspected, as well also as those of the sea parrot or puffin, *(Fratercula,)* shags or cormorants, *(Graculus,)* and the red-legged kittiwake, *(Larus brevirostris.)* These are all accessible on every side, affording

SPEARING SEA-LION COWS.

"The Death Whorl" —Near the Village, St. Paul's Island—November 26, 1872.

the observer an unequaled opportunity of noticing these birds through the breeding season, from its beginning in May until the end in September.

"Not one of the water-birds found on and around the Islands is exempted from a place in the native's larder; even the delectable shags, 'oreelie,' are unhesitatingly eaten by the people, and indeed furnish, during the winter season especially, an almost certain source of supply for fresh meat. The large, gaily-colored eggs of the 'arrie' (*Uria arra*) are gathered in June and July, without stint, for use, and might be packed away in lime-water by the barrel, so as to keep through the year, if any provident or thoughtful action was taken in the matter. Walrus Island would alone supply the whole demand from year to year. On the occasion of my visit there, July 5, 1872, six men loaded a bidarrah, capable of carrying four tons, exclusive of crew, down to the water's edge with eggs, in less than three working hours.

"During the winter months the birds are almost wholly absent. They begin to make their first appearance, in any number, for the season, early in May, and by the middle or end of September the great body of the millions that have bred during this time go to sea, and are not again noted, save a few stragglers now and then, until they re-assemble next May, for the repetition of their reproductive processes. The stress of severe weather in the winter months, driving snow-storms, and floating ice-floes brought down from the north, which shut the Islands in, still, cold, and quiet, are cause enough for the disappearance of the water-fowl.

"The position of the Islands is such as to lie somewhat outside of the migratory path pursued by the birds on the main-land, and, owing to this reason, they are only visited by a few stragglers from that quarter, and also from the Asiatic side. One species, (*Strepsilas interpres,*) however, comes here every summer, for three or four weeks' stay, in great number, and gets so fat in feeding upon the larvæ found on the killing-grounds that it often bursts open when it falls, after being shot on the wing. Our robin (*T. migratorius*) was seen by myself, near Saint Paul's Village, one cool morning in October, (the 15th,) and the natives told me that it had been noticed before in this way, never staying more than a few days or a week, and being brought there, undoubtedly, by some storm or gale of wind taking it up and off from its path over the main-land. In the same manner hawks, owls, and numerous strange water-fowl visit the Islands, but never remain there long.

"The Russians tried the experiment of bringing up from Sitka and Ounalashka a number of ravens, with the view of stimulating them to live and breed upon these Islands, where they would be almost invaluable as scavengers; but the birds invariably, sooner or later, and within a short time, took flight for the main-land or the Aleutian Islands. At the time of present writing the Alaska Commercial Company have sent up to the village of Saint Paul's a number of domestic pigeons, and the experiment will be tried with them.

"The natives have always, and still do, keep a small number of chickens; and, where poultry is taken into the winter living-rooms of these people, they get return in eggs. But the maintenance of a hennery, owing to the long season of cold,

stormy weather, compelling the chickens to hunt shelter for weeks at a time, is impracticable, regarded with a view of profitable recompense for time and care.

"Walrus Island is the most favorable spot, in this whole Alaskan country, to observe the nesting and breeding birds of Behring Sea. It is a low, lava rock, seven miles to the eastward of Northeast Point, with an area of less than five acres, rugged, and bare of all vegetation, save a species of close-growing curly grass. Here the *Lomvia arra* and many gulls, cormorants, sea-parrots, and auks come to lay their eggs in countless numbers. The face and brow of the low, cliff-like sea-front are occupied almost exclusively by the 'arries,' (*Lomvia arra,*) which lay a single egg each, on the surface of the bare rock, and stand straddling over it while hatching, only leaving at irregular and short intervals to feed. Hundreds of thousands of these birds alone are thus engaged about the 29th of June on this little Island, standing stacked up together like so many bottles, as thickly as they can be stowed, making all the time a deep, low, hoarse, grunting noise. They quarrel among themselves incessantly, and in this way roll thousands of eggs off into the sea, or into crevices and fissures, where they are lost and broken.

"The 'arrie' lays but one egg. If this is removed or broken, she will soon lay another; but, if undisturbed after depositing the first, she undertakes the hatching at once. The size, shape, and coloration of this egg are exceedingly variable. A large proportion of the eggs become so dirty, by rolling here and there in the excrement while the birds tread and quarrel over them, as to be almost unrecognizable. The shell is very tough, and the natives, when gathering them, fill tubs, baskets, &c., on the cliffs, carry them down to the general heap collected near the boats' landing, and pour them out upon the rocks with a single flip of the hand, just as a basket of apples would be emptied; and, after this, they are again quite as carelessly handled when loaded into the 'bidarrah,' sustaining through it all very little injury.

"The small grassy interior of the Island, which is sharply margined by the surrounding breeding-belt of 'arries' on the shore-line, is the only place, I believe, in this sea where the great white gull (*Larus glaucus*) breeds. Among the little grassy tussocks here, it builds a nest of dry grass, sea-ferns, &c., very nicely laid up and rounded, and in which it lays usually *three* eggs, sometimes only a couple; in exceptional instances I have seen four. These big gulls could not breed on either of the other Islands in this manner, for the foxes there would have the upper hand instantly; and the bird is too large to settle on the narrow shelf-ledges of the cliffs, like the smaller gulls and other water-fowl.

"The red-legged kittiwake, *Larus brevirostris*, and its cousin, *Larus tridactylus*, build in the most amicable manner together on the faces of the cliffs, associated with cormorants, sea-parrots, and auks, all together, and, with the exception of the latter, the nests are all easy of access.

"As we land the 'arries' fly from their eggs off and around for a short distance, and then settle down into the sea in platoons or files, swaying hither and thither with the movement of swell and tide, trailed out over the water like great whip-lashes. Watch a boat as it approaches one of these swimming phalanxes and alarms it; out the birds sprawl, half

WALRUS HERD.

Adult males—Walrus Island—July 5, 1872.

swimming and half flying, making a noise like a shower of hail-stones falling upon a roof, as the scare spreads from bird to bird, until the whole vast flock is beating the water with a hundred thousand wings in almost vain endeavor to rise from the calm surface, for these birds in still weather have great difficulty in taking flight. They, however, succeed well and quickly when heavy swells or little wavelets lift them. A gull, on the contrary, rises gracefully and easily from the water, and, indeed, is the most attractive bird on the wing of all water-fowl."

"I have time after time been struck by the wonderful temerity of the foxes, (on Saint George's Island especially,) while secretly watching them as they were climbing up and down the faces of almost inaccessible cliffs, seeking eggs. They go on a full run or in a stealthy tread over the brows of cliffs that fairly overhang the sea six and nine hundred feet below. They always bring the eggs up in their mouths, and carry them back from the brink of the precipice, where they leisurely suck them, usually biting the shell out at the large end. The 'arrie' suffers the most from these enemies, which are the only natural foes that the bird-kind has to contend with on these solitary Islands."

1. **Turdus migratorius,** LINN.—*Robin.* "Rap-o-loof."

Casual, and rarely seen; never resident. (Spec., October, 1872.)

"I was most agreeably surprised, one cool morning early in October, while walking up on the Village Hill, Saint Paul's Island, to see a robin, a red-breasted robin, silent and gloomy, hopping and fluttering before me. It had evidently been brought to the Island by the gale which blew two days previously, and was even now casting about for a good chance to leave. In order that I might observe the length of time this old friend of mine would stay with us, I did not shoot him, but strolled out to the locality every morning and evening until the end of the third day, when I missed him. The natives recognized it as a chance visitor, though seen almost every year in this manner. Two weeks later I observed a small flock of *Ægiothi*, (red polls,) which were passing over the Island, alighting here and there to feed. They are regularly seen migrating to the southward every fall."

50*a*. **Anorthura troglodytes** var. **alascensis,** (BD.) COUES.—*Alaskan Winter Wren.* "Limmer-shin."

Troglodytes alascensis, BAIRD. Trans. Chicago Acad., i, 315, pl. 30, fig. 3, (1869.) Saint George's Is.
Anorthura alascensis, COUES. Key N. A. Birds, 87, (1872.)
Anorthura troglodytes var. *alascensis*, COUES. *Ibid.*, 351.
Troglodytes hyemalis var. *alascensis*, DALL. Proc. Cala. Acad. Sci., (Feb. 8, 1873.)

This interesting local form of *Anorthura* differs from the ordinary North American bird in its superior size and darker brown colors, and in the much greater length and calibre of the bill. In young birds the difference is less strongly marked. The dimensions of an adult in Mr. Elliott's collection are as follows: bill, along culmen, .58; wing, 1.90; tail, 1.30; tarsus,

.62; middle toe and claw, .64. The corresponding dimensions of an average specimen of var. *hyemalis* are: .39, 1.80, 1.20, .62, .58.

"This brave little bird was first brought into notice by Mr. Dall, who collected a single specimen while on the Island in 1868, and sent it to the Smithsonian Institution. In his brief note accompanying it he speaks of its being abundant there, while I, in 1873, shot almost every one that I saw, and yet at the end of the season, August 4, I had but seven specimens. It was seldom seen.

"It is not a migratory bird, but remains permanently upon the Island. Its nest is built in small, deep holes and crevices in the cliffs. I have not myself seen it, but the natives say that it lays from eight to ten eggs, in a nest made of soft, dry grass and feathers, roofed over, with an entrance at the side to the nest-chamber, thus being of elaborate construction.

"The male is very gay during the period of mating and incubation, flying incessantly from plant to plant or rock to rock, singing a rather shrill and very loud song, and making, for a small bird, a great noise.

"I shot the young, fully fledged, on the 28th of July, differing only from the parent in having a much shorter bill, and in a general darker and more diffuse coloration.

"Although Saint Paul's Island is but twenty-seven miles to the northwest from Saint George's, not a single specimen of this little wren has been seen there. I made, during the whole season of 1872, unavailing search for it.

"The native name, 'limmer-shin,' signifies a 'chew of tobacco,' and is given on account of the resemblance of this wee bird in size and color to a tobacco-quid."

Mr. W. H. Dall found this species to be resident and abundant on the rocky cliffs of Amaknak Island, Unalashka, where, he says, "it is quite familiar and bold. It builds in the crevices of the rocks, but I was not able to find the nest. It has a cheerful and melodious note, and is, to some extent, gregarious, three or four being usually seen together. It was not seen in the Shumagins, though it may occur there."

144*a*. **Leucosticte tephrocotis** var. **griseinucha,** (BRDT.) COUES.—*Gray-eared Finch.* "Pahtoshkie."

Linaria griseinucha, BRANDT. "Orn. Ross., (1842.)"

Leucosticte griseinucha, BP. Consp. Av., i, 537, (1850.)—BP. et SCHLEGEL. Monog. *Loxiens*, 5, pl. xli, (young) (1850.)—BD. B. N. Amer., 430, (1858.)—DALL et BANN. Trans. Chicago Acad. i, 282, (1869.)—COOP, B. Cal. i, 161, (1870.)—DALL, Pr. Cala. Acad., (Feb., 1873.)

Leucosticte tephrocotis var. *griseinucha*, COUES. Key, 130, fig. 77, (1872.)

Leucosticte griseogenys, GOULD. P. Z. S., 104, (1843,) and Voy. Sulphur, i, 42, pl. xxii, (1844.)

Leucosticte littoralis, BD. Trans. Chicago Acad., i, 317, pl. xxviii, fig. 1, (1869.)—COOP. B. Cala. i, 163, (1869.)—DALL. Proc. Cala. Acad., (Feb., 1873.)

Leucosticte tephrocotis var. *littoralis*, COUES. Key, 130, (1872.) (*Cf.*, *ibid.*, 352.)

Numerous beautiful specimens of the adults of both sexes in high breeding attire, and others illustrating the earliest plumage

BIRDS NESTING ON WALRUS ISLAND.

June and July—July 5, 1872.

of the young, are in the collection. There are no appreciable outward distinctions of sex. The bill at this season is black, the ash and black of the head are pure and well defined, the chocolate brown is rich, and the rosy tends to crimson. The very young birds are dark, sooty gray, overlaid with brown; a lighter and more rusty shade of the same edges the wing-feathers, and the bill is in part light colored.

Although this form is much larger than typical *tephrocotis*, and otherwise different in the *pictura* of the head, we do not find ourselves enabled to separate it specifically, since numerous intermediate specimens attest its intergradation with the former. Nor do we find it necessary to distinguish the slight variety, *littoralis*, by name; we refer it to var. *griseinucha*, considering both forms as the single arctic representative of *tephrocotis* proper.

"This agreeable little bird, always cheerful and self-possessed, is a regular and permanent settler on the Islands, which it never leaves. In the depth of dismal winter, as well as on a summer's day, the pahtoshkie greets you with the same pleasant chirrup, wearing the same neat dress, as if determined to make the best of everything. It is particularly abundant on Saint George's, where its habits may be studied to best advantage.

"The pahtoshkie nests in a chink or crevice of the cliffs, building a warm, snug home for its little ones of dried grasses and moss, very neatly put together, and lined with a few feathers. The eggs vary in number from three to six, being generally four. They are pure white, with a delicate rosy blush when fresh; and measure .97 by .67 inch. The young break the shell at the expiration of twenty or twenty-two days' incubation, the labor of which is not shared by the male, who, however, brings food to his mate, singing the while, as if highly elated by his prospects of paternity. The chicks, at first, are sparsely covered with a sprinkling of dark gray down, and in two or three weeks gain their feathers, fitting them for flight, although they do not acquire the bright rosy hues and rich brown of the parents the first year. Between the old birds there is no outward dissimilarity according to sex, the male and female being exactly alike in size, shape, and coloration.

"They feed upon various seeds and insects, as well as the larvæ which swarm on the killing-grounds. They are fearless and confiding, fluttering in the most familiar manner around the village huts. In the summer of 1873, a pair built their nest and reared a brood under the eaves of the old Greek church at Saint George's.

"The nests, of which I collected fifteen or twenty, are very neatly made up of dry grass and moss, thick, and compactly interwoven, placed on the faces of the basaltic and breccia cliffs which rise from the shore-line of the Islands. These disintegrating tufa and breccia bluffs afford a thousand and one little pockets and crannies in which the pahtoshkie builds, secure from molestation by prowling foxes. It has no song, but utters a low, mellow chirp, alike either when flying or sitting. It is most abundant on Saint George's, where hundreds may be seen at any time during a short walk along the north shore. It consorts in pairs throughout the year, never going in flocks, and seldom flying or feeding alone."

Mr. W. H. Dall remarks upon the abundance of the bird on the Aleutians as well as on the Prybilov Islands. In

August, he says, it has no song, "except a clear chirp, sounding like 'wéet-a-wéet-a-wée-weet.' It was on the wing a great part of the time, avoiding alighting on the ground, but darting rapidly in a series of ascending and descending curves, now swinging on the broad top of an umbelliferous plant, now alighting on some ledge of the perpendicular cliff, jumping from point to point, seemingly delighted in testing its own agility." He found it particularly numerous in Unalashka, where it is resident. A nest, which he discovered May 24, contained five white eggs, fresh; it was placed in a crevice of a rocky bank, about twelve feet above the beach, and was neatly built of grasses, lined with a few feathers.

152. **Plectrophanes nivalis,** (L.) MEYER.—*Snow Bunting.* "Snaguiskie."

Among Mr. Elliott's many specimens in pure black and white attire are a few, in the earliest plumage of the young, probably never seen in the United States. The general color is gray, overlaid slightly with a light-brown cast, the interscapular feathers having a dusky centre. The gray fades on the breast into dull whitish, which occupies the rest of the under parts. Most of the secondary quills are white, with a dusky touch on the outer webs; the three inner ones, however, are black, with broad, chestnut-brown edging. Three lateral tail-feathers are mostly white.

"The snow-bird is another permanent resident of these Islands, but one which, unlike the *Leucosticte*, is rather shy and retiring, nesting high on the rocky, broken uplands, and only entering the village during unusually severe or protracted cold weather.

"The snaguiskie builds an elegant and elaborate nest of soft, dry grass, and lines it warmly with a thick bed of feathers. It is placed on the ground, beneath some lava-slate, or at the foot of a boulder. Five eggs are usually laid, about the 1st of June; they are an inch long by two-thirds broad, of a grayish or greenish white, spotted sometimes all over, sometimes at or around the larger end only, with various shades of rich, dark-brown, purplish-brown, and paler neutral tints. Sometimes the whole surface is quite closely clouded with diffuse reddish-brown markings.

"The female assumes the entire labor of the three weeks' incubation required for the maturing of the embryos. During this period the male is assiduous in bringing food, and, at frequent intervals, sings his simple but sweet song, rising, as he begins it, high up in the air, as the skylark does when carolling, and, with the end of the stave, dropping suddenly to the ground again. The young are early provided with a gray downy coating, which is speedily replaced by a plumage resembling that of the adult female, and, in less than four weeks from the day of hatching, the little snaguiskie is as big as its parents, and weighs more.

"The food of this species consists of the various seeds and insects peculiar to the rough, higher grounds it frequents. It never flies about in flocks, and at this season cannot be called gregarious, like the Lapland longspur, with which it is associated on these Islands."

BIRD'S-EYE VIEW OF WALRUS ISLAND.

A. Bluffs occupied by the gulls (Rissa), cormorants (Graculus), and arries (Uria), in nesting from June to September.
B. Belt of rock exclusively occupied by the arrie (Uria arra) in incubating.
C. Area of grassy rocky flat occupied by the great white gull (Larus glaucus) for nesting.
D. Boulders and shingle in which the sea-parrots and "chooch-kies" conceal their eggs.

153. **Plectrophanes lapponicus,** (L.) SELBY.—*Lapland Longspur.* "Karesch-navie snaguiskie."

We give a description of the breeding-plumage of the female, probably not generally known: Upper parts of the body, wings, and tail almost precisely as in the male. Cervical collar evident, but not sharply defined, nor so rich in color. Black of the crown variegated with pale tips of the feathers; white of the supra-ocular and post-auricular lines tinged with buff; no continuous pure black on the sides of the head, chin, or throat; sides of the head blackish, interrupted with grayish auriculars; throat similarly varied, but chin left nearly pure white, the pattern of the black which obtains in the male being thus clearly indicated, but interrupted and obscured; sides of the breast and belly with disconnected, sparse, sharp, slender, dark-brown streaks, instead of the pure black, continuous, broad and heavy stripes of the male; other under parts as in the male. Bill obscure yellowish, dusky at tip; feet dark-brown, but not black. Dimensions slightly inferior to those of the male.

The eggs of the Lapland longspur are extremely variable in coloration—few more so. They range from a nearly uniform dark chocolate-brown, (much like those of a marsh-wren,) through a lighter chocolate in innumerable dots on a grayish-brown ground, to a peculiar brownish-white ground, variously clouded and smirched with chocolate, and having, besides, irregular sharp spots, scratches, and straggling lines of blackish-brown. The general aspect of these eggs is like that of an oriole's or blackbird's. They measure .80 to .90 in length by .55 to .60 in breadth. The labels of various specimens before us from Arctic America record a nest of "hay," lined with deer's hair or feathers.

"The longspur, a resident bird, is a delightful vocalist, singing all through the month of June in the most charming manner, rising high in the air, and hovering on fluttering wings over its setting mate. The song is only too short, lasting but a few moments, though continually repeated. The bird is much more shy and reserved than the common snaguiskie, rarely entering the village It is most abundant on Saint Paul's, where, unlike the snowflake, it seeks the low, grassy grounds, both for food and nesting, being never found among the rough boulders chosen for a home by the other species of *Plectrophanes*.

"Two nests which I found were built in tussocks of grass, on a low, 'hummocky' flat, between the village and the main ridge of Saint George's, sheltered and half concealed beneath a drapery of withered grass. In each case the mother bird did not fly away till I almost stepped on the nest, when she quickly disappeared, in perfect silence. One nest contained four, and the other five eggs, rather smaller than a snowflake's, and of a rich, gray-brown color, with deep shades of brown running over them in spots and suffused lines.

"These nests were not discovered until the 7th of July, at which date the eggs in both were perfectly fresh. They were, probably, not laid until about the end of June. The young appear in the same manner as those of *P. nivalis.* The males do not assume the distinctive coloration of their sex until the next season. The natives say that very severe weather sometimes drives these birds away, although the other *Plectrophanes* is never forced to leave."

226. **Corvus corax,** L.—*Raven.* "Var-rone."

As noted in Mr. Elliott's general introduction, the experiment of introducing ravens was unsuccessfully tried by the Russians.

"The natives still claim that if a number of *young* birds were brought here and raised, they could be induced to remain upon the Islands during the whole season; that the failure to keep those ravens brought up from Ounalashka, several years ago, was due to the fact of their being old birds.

"At Ounalashka there is a Greek Catholic church, with a small cupola, surmounted, as is usual, by a large crucifix. Upon this these ill-omened, croaking birds perch at all hours of the day, defiling the cross and tinned dome-roof below them, without exciting the slightest sense of the ridiculous or impropriety among the people there, the stranger only being amused."

341. **Falco sacer,** FORST.—*Gyrfalcon.*

Falco sacer, FORST. Phil. Trans. lxxii, 423, (1772.)—BAIRD. Trans. Chicago Acad. i, 271, (1869.)—COUES. Key N. A. Birds, 213, (1872.)

Finding nothing definite in Mr. Elliott's manuscripts respecting this bird, we conclude that it does not reside on the Islands, where, however, its casual presence is attested by a specimen in the collection labeled "Saint Paul's, March, '73." It is a young bird, apparently in its second year, which had doubtless wandered or been forced out of its usual way.

However we may interpret the relation subsisting between the various forms of *Hierofalco*, the name *Falco sacer* (FORST.) is specially pertinent to the present one, and has priority over the several designations more frequently employed.

"Hawks, like owls, are occasionally seen on the Islands, the latter during the winter, especially. They do not remain long, and never breed, although the natives on Saint George's stoutly assert that a 'small brown owl' breeds there. I made unavailing search for it." Very probably the hawk-owl, (*Surnia ulula.*)

396. **Charadrius fulvus,** GM.—*Golden Plover.*

Charadrius fulvus, GM. Syst. Nat., i, 687, (1788.)
Charadrius pluvialis, HORSF. Trans. Linn. Soc., xii, 187, (1822.)
Charadrius xanthocheilus, WAGLER. Syst. Av., *Charad.* sp. 36, (1827.)
Charadrius taitensis, LESS. Man. Orn. ii, 321, (1828.)
Charadrius virginianus, JARD. et. SELB. Ill. ii, pl. 85, (*circ.* 1830.)
Charadrius glaucopus, FORST. Descr. An., ed. Licht., 176, (1844.)
Charadrius virginicus, BLYTH. Cat. B. Mus. As. Soc., 262, (1849.)
Charadrius longipes, TEMMINCK.
Charadrius auratus orientalis, TEMM. et. SCHLEG. Fn. Japonica.

Inhabitants of St. Paul's Island--Winter of 1872-'73.

1. *Luka Mandrigan*, 53 *years.*
2. *Paraskievie Seeribneekova*, 14 *years.*
3. *Nicolai Neederazov*, 9 *years.*
4. *Akylena Seeribneekova*, 10 *years.*
5. *Kerick Arkashav*, 15 *years.*
6. *Aggie Kooshin*, 17 *years.*
7. *Fevronia Evanov*, 11 *years.*
8. *Matroona Volkov*, 14 *years.*
9. *Phillip Volkov*, 52 *years.*
10. *Anoneka Meeseekin*, 14 *years.*
11. *Demetri Veatkin*, 54 *years.*

Charadrius auratus, SCHRENK. Amur Reise, 410, (1860.)
Pluvialis fulvus, SCHLEGEL. Mus. Pays-Bas., *Cursores*, p. 50, (1864.)
Pluvialis fulvus, taitensis, xanthocheilus, longipes, BP. Compt. Rend., 417, (1856.)

The single specimen of golden plover preserved by Mr. Elliott is of special interest and importance, since it is conclusively determined to be the true Asiatic *fulvus*, and not the North American var. *virginicus*. This discovery represents an addition to our *Fauna*, for *C. fulvus* has not hitherto been recognized as North American. We have made the comparison with numerous examples before us from various Asiatic and Pacific localities, finding the present specimen indistinguishable. Length, about 9.50; wing, 6.40; tail, 2.60; tarsus, 1.60; middle toe and claw, 1.10; culmen, .95. There is a yellowish suffusion about the head, particularly along the superciliary line, which is hardly to be noticed in the ordinary North American bird. The specimen was taken on Saint Paul's, May 2, 1873. "A few stragglers land in April, or early in May, on their way north to breed, but never remain long. They return in greater number in the latter part of September, and grow fat upon the larvæ generated on the killing-grounds, leaving for the south by the end of October."

406. **Strepsilas interpres,** L.—*Turnstone.* "Krass-nie Ko-lit-skie."

The numerous specimens all alike indicate an interesting approach to the peculiar features of var. *melanocephalus*, in the extent and intensity of the black areas on the head, neck, and back. The chestnut, in fact, is reduced mainly to a scapular patch, some edging of the feathers of the interscapular region, and a diffuse area on the wing-coverts. The upper parts of the body are otherwise black, relieved by the broad, pure white area of the lower back and rump, and varied with white on the crown and cervix. The front, sides of head and neck, throat, and entire breast are intense black, relieved by loral, gular, auricular, and latero-cervical white areas.

"The turnstone arrives in flocks of thousands about the third week in July, and takes its departure about the 10th of September. It does not breed here. On its arrival it is quite poor in flesh, but, feeding upon the larvæ and maggots of the killing-grounds, it rapidly gains, and at length becomes extraordinarily fat—so fat that frequently it bursts open as it falls to the ground when shot on wing.

"It is a very handsome bird when in full plumage, with its bright-red legs, snowy, black-banded breast, and back tinged with brown and green reflections. Its well-known curious actions, in pursuit of its ordinary food, have given it its name. I met with it at sea, eight hundred miles from the nearest land, flying northwest towards the Aleutian Islands."

410. **Lobipes hyperboreus,** (L.,) CUV.—*Northern Phalarope.*

The egg of this species, not yet generally well known, presents the following characters, taken from the unparalleled series in the Smithsonian Institution, collected at various points in the Yukon and Anderson River region: The ground varies from dark greenish-olive, or brownish-olive, through various lighter drab tints, nearly to a buffy-brown, occasionally

to a light-gray. The markings are usually heavy and bold, consisting of large spots, and still larger blotches or splashes resulting from their confluence, mingled with dots and scratches in interminable confusion. In general pretty evenly distributed, they often tend to aggregate about the larger end, in rarer instances forming a perfect wreath. In a few instances all the markings are mere dots. As a rule, the size and heaviness of the markings bear some proportion to intensity of the ground color; the markings are dark bistre-brown, chocolate, and sometimes still lighter brown. The longest and narrowest egg of several dozen measures 1.30 by only .75; a short, thick egg gives only 1.10 by .82; the average is about 1.20 by .80. The eggs are three or four in number, oftenest the latter, and are generally laid in June, oftenest in the latter half of the month. They are deposited in a slight depression of the ground, variously lined with a little withered vegetation.

"A few stray couples breed upon the Islands, nesting around the margins of the lakelets. The egg I was unable to find, but I secured several newly-hatched young ones which were very pretty and interesting. They are only two or three inches long, with a bill about a third of an inch in length, and no thicker than an ordinary dressing-pin. The down of the head, neck, and upper parts is rich brownish-yellow, variegated with brownish-black, the crown being of this color mixed with yellow, and a long stripe extends down the back, flanked with one over each hip, another across the rump, and a shoulder-spot on each side. The under parts are grayish silvery-white. This bird, when startled, or solicitous for the safety of its young, utters a succession of sonorous '*tweet*' sounds, quickly repeated, with long intervals of silence."

411. **Phalaropus fulicarius,** (L.,) BON.—*Red Phalarope.*

The nidification of this species is similar in all respects to that of *L. hyperboreus*, and the egg cannot be distinguished with certainty in any given instance. They average, however, somewhat larger—about 1.25 by .85. The largest specimen measured 1.30 by .90; the shortest, 1.15 by .90. Numerous specimens, in the Smithsonian collection, were taken early in July, at Franklin Bay, on the Arctic coast, by Mr. R. Macfarlane.

"Though much more abundant than the preceding, at certain times, I am satisfied that the red phalarope does not breed here. It is found, like the other, by the marshy margins of the lakelets, solitary or paired, but never in flocks. The earliest arrivals occur in June, but the birds re-appear in greatest number about the 15th of August. They all leave by the 5th of October."

426 *bis.* **Tringa crassirostris,** TEMM. et SCHLEGEL.—*Thick-billed Sandpiper.* "Ko-lits-kie."

Tringa crassirostris, TEMM. et SCHLEGEL. Fauna Japonica, 107, pl. 64, (1846.)(?)—DALL. Amer. Naturalist, vii, 635, (Oct., 1873.)—COUES. Check-List, 85, No. 426 *bis*, (1873.)

The most interesting result, in some respects, of Mr. Elliott's ornithological researches is the determination of the occur-

Sketches.

rence of this species in abundance on the Prybilov Islands, where it breeds. This discovery adds a species, previously unrecognized as North American, to our *Fauna*. The announcement was lately made by Mr. W. H. Dall, as above, upon the strength of one of Mr. Elliott's earlier specimens from Saint Paul's. This example was identified by Mr. J. E. Harting,[1] of London, well known for the extent and accuracy of his investigations of the Limicoline groups, to whom it was transmitted for the purpose by the Smithsonian Institution. Mr. Elliott's later collections contain numerous specimens, among them several newly-hatched young, hitherto probably unknown. No description of the species having been published in this country, we subjoin the following:

Adult, in breeding-plumage. (No. 64249, Mus. S. I.—676, Coll. H. W. E.—July 22, 1873. Saint George's.)—With somewhat the general appearance of a *Tringa alpina*, but the black area on the under parts pectoral, not abdominal. Bill about as long as the head, straight to the end,[2] compressed, stout, and high at the base, with very long nasal fossæ, reaching to within $\frac{1}{8}$ inch of the tip, and deep at the base; the groove of the under mandible co-extensive in length, but linear throughout. Feathers on side of under mandible extending beyond those on the upper; the interramal feathers projecting still a little ways further. Legs very short, (much as in *Tringa maritima;*) tibial feathers reaching nearly or quite to the suffrago; tarsus shorter than the bill, or than the middle toe and claw. Wings and tail as usual throughout the genus.

A coronal area, the upper back, interscapular region and scapulars black, completely variegated with rich chestnut-brown, paler ochrey-brown and whitish, the body of each feather being black, with one or another or all of these various edgings; the coronal separated from the interscapular markings by a grayish-white, dusky-streaked, cervical interval. Lower back and rump and upper tail-coverts blackish-brown or grayish-black, only varied with an occasional chestnut-edged feather. Wing-coverts grayish-brown, with narrow white edging, the greater with broad, definite white tips. Secondaries nearly all pure white, a few of the outermost, and innermost also, with grayish-brown touches near the end. Primaries grayish-brown with white shafts, except at tip, and fading to white on the inner webs toward the base; several of the innermost, also, largely white on the outer web, and with definite white tipping. Central tail-feathers brownish-black; next pair a ptly paler, grayish; the rest white, or nearly so, with a faint gray tint. Front and sides of head, superciliary line, the tufts of flank-feathers, and entire under parts, white, interrupted on the breast with a large but not perfectly continuous nor well-defined blackish area, and marked on the upper breast and sides with a few narrow, sharp, blackish shaft-lines.

[1] Deferring to this excellent authority on Limicoline birds, and without a copy of the work in which *Tringa crassirostris* was originally described at hand, we have presented it under the same name. But almost certainly it is *not* the bird described by Schlegel as *Tringa crassirostris* in the Museum des Pays-Bas. The characters there given are those of a different bird altogether. By no latitude of interpretation can they be rendered applicable to the present species. In case our bird, here described in detail, be found not the same as the true *Tringa crassirostris*, it may appropriately be named *T. ptilocnemis*, in allusion to the feathered tibiæ. We consider it most nearly allied to *Tringa maritima*, next to which it may take its place in the system.

[2] In other specimens, and usually, the bill is considerably longer, exceeding the head, and decidedly decurved at the end.

a dusky auricular patch. Legs and bill dark. Length, apparently about 9.50 inches; wing, about 5; tail, 2.50; bill, 1.10 to 1.40; tarsus, .90 to 1.00; middle toe and claw, 1.05 to 1.20.

The sexes are not distinguishable by any outward mark. We have before us no specimen in complete fall plumage; but one taken June 9, still retaining at that date the past season's plumage, for the most part, enables us to predicate the autumnal and winter vesture. The difference is entirely analogous to that seen in various other sandpipers. It consists in the great development and intensity of the chestnut edgings of the feathers of the upper part, to the restriction of their black fields, and to the exclusion, nearly complete, of the pale-ochrey and whitish edgings which make up the characteristic variegation of the breeding plumage, in the absence of any dividing cervical interval between the coloration of the crown and that of the back, and especially in the strong, complete suffusion of the sides of the head and the whole throat with tawny-brown. The pectoral area is only indicated by scattered blackish feathers, being in the fall probably still more obscure, or rather replaced merely by a few dusky streaks or spots.

Newly-hatched young, (taken early in July.)—These interesting little creatures, two or three inches long, are very prettily marked. The down of the under parts is silvery-white; that of the upper is rich reddish-brown, varied with black, and with curiously sharp, whitish dots of definitely rounded contour, appearing like spots of mildew. Each such spot is about as large as a pin's head, and, examined with a lens, is seen to be the enlarged, circumscribed, brushy end of a downy plume, whence several tiny bristles project. Each such plume is white basally, then black for a distance, ending in the whitish tuft. The areas thus dotted correspond, consequently, to the areas of black variegation; but there is, also, a black, undotted loral spot, frontal line, and a few other markings. The bill is mostly black, very short and slender; the legs are comparatively long and stout, and appear to have been light-colored.

Nearly-fledged, not quite grown, young, (taken late in July.)—Several specimens retaining down, or traces of it, about the head and neck, otherwise completely feathered. The upper parts are much as in the adults in the breeding-season, as to the colors of the variegation, but the markings are in simple curved lines rather than sharp V-shaped patterns, and the edgings are much narrower. The edgings of the wing-coverts have an ochrey cast. The interior tail-feathers have rusty edgings. The throat and breast are more or less suffused with pale rusty; there is no black pectoral area, but the jugulum, breast, and sides have an indefinite number of suffused, dusky markings.[1]

[1] In Mr. Hasting's letter upon the subject, handed us by Professor Baird, to whom it was addressed, the following occurs, in substance: *T. crassirostris*, T. & S., Sch., M. P. B., *Sclop.*, 1864, 28; Blak., Ibis, 1862, 315–330.—Hab., China, Japan, Java, Borneo.—Syn., *Schœniclus magnus*, Gould, P. Z. S., 1848, 39; B. Aust., vi, pl. 33; *Tringa magna*, Bp., C. R., 1856; *Tringa tenuirostris*, Gould, Hdbk. B. Aust., ii, 1865, 260, (*nec* Horsf., Linn. Trans., xiii, 1820, 192, *quæ Totanus stagnatilis*, L.) "Temmick & Schlegel say, (*l. c.*,) 'This species belongs to the same type as the Knot, (*T. canutus*,) but is much more robust in size, the bill is longer, the tarsi are longer, and the toes more robust,' (this is a mistake;) 'finally, it differs in the very different coloration of the plumage, notably in the breeding-season.'" * * * "It seems to me that the bird is in every respect a large dunlin, (*T. cinclus*,) which it resembles much more nearly than it does *canutus*, not only in regard to the structure of the bill and feet, but in the character of the breeding-plumage," &c. Now, our *T. p'ilocnemis* bears a wonderful superficial resemblance to an overgrown dunlin, but its affinities, as shown by *the feathered tibiæ, and tarsus shorter than the middle toe*, are entirely with *T. maritimus*, as already said, and some plumages very closely resemble the extensively whitened winter-dress of the latter.

Ice Dock Bustling. Tantallon Point

Fragment Snow & Ice Floes at the East Landing
Jan. 20th 1873.

Winter Sketches.

The following measurements of a number of adult specimens will illustrate the size and shape, and, to a great extent, the normal variations in dimension of the species:—

Measurements.

Locality.	Date.	S. I. No.	Coll. No.	Sex.	Wing.	Tail.	Culmen of bill.	Tarsus in front.	Middle toe and claw.
Saint George's Island	July 22	64249	676	♀	5.10	2.50	1.12	0.90	1.08
Do	22	64250	677	♀	5.20	2.60	1.28	1.00	1.10
Do	4	64251	590	♀	5.10	2.30	1.10	0.94	1.16
Do	7	64252	597	♀	5.09	2.50	1.20	0.95	1.06
Do	7	64253	600	♀	5.10	2.80	1.45	1.00	1.15
Do	June 19	64254	462	♀	5.15	2.75	1.40	0.98	1.08
Do	July 7	64255	602	♀	5.10	2.40	1.30	0.97	1.12
Do	7	64256	601	♀	5.18	2.70	1.41	0.95	1.13
Do	7	64257	596	♀	4.80	2.50	1.25	0.90	1.12
Do	4	64258	585	♀	5.00	2.50	1.30	0.96	1.15
Do	4	64259	587	♀	5.05	2.40	1.25	0.97	1.07
Do	7	64260	675	♂	5.25	2.80	1.42	0.95	1.20
Do	1	64265	574	------	5.35	2.75	1.40	1.00	1.10
Do	4	64266	588	♀	5.30	2.70	1.45	0.98	1.20
Do	7	64267	598	♀	4.90	2.50	1.20	0.96	1.14
Do	7	64268	599	------	4.90	2.30	1.30	0.91	1.10

"This is the only wader that breeds upon the Prybilov Islands, with the marked exception of a stray couple now and then of *Phalaropus hyperboreus*. It makes its appearance early in May, and repairs to the dry uplands and mossy hummocks, where it breeds. The nest is formed by the bird's selection of a particular mossy-bunch, and there setting. It lays four darkly-blotched pyriform eggs, and hatches within twenty days. The young come from the shell in a thick yellowish down, with dark-brown markings on the head and back, getting the plumage of their parents and taking to wing as early as the 10th of August; and at this season old and young flock together for the first time, and confine themselves to the sand-beaches and surf-margins about the Islands for a few weeks, when they take flight by the 1st or 5th of September, and disappear until the opening of the new season.

"It is a most devoted and fearless parent, and will flutter in feigned distress around by the hour, uttering a low piping

note, should one approach its nest. It also makes a sound exactly like our tree-frogs, and until I had traced the matter to this source, I searched several weeks unavailingly for the presence of these reptiles, misled by the call of this bird."

A set of four eggs of this species, the full complement, taken by Mr. Elliott,[1] June 19, 1873, on Saint George's, are perhaps the first specimens which have reached naturalists; certainly the first we have had in this country. They appear to have been nearly or quite fresh at the date mentioned. The egg is rather a peculiar one; of all the sand-piper's eggs before us, it most resembles that of *Tringa maritima*. The shape is regularly pyriform, as usual in this family. Measurements of the four examples are: 1.55 × 1.08; 1.52 × 1.05; 1.50 × 1.08; 1.48 × 1.05. The ground is nearly clay-color, but with an appreciable olivaceous shade; the markings are large, bold, and numerous, of rich, burnt-umber brown, of varying depth, according to the quantity of the pigment. These surface-markings occur all over the shell, except the extreme point, and are solidly massed by confluence on the larger half of the egg; all the markings are strong, as if laid on freely with a heavily-charged brush. With these surface-spots occur numerous shell-markings of the same character, but, of course, obscure, presenting a stone-gray or purplish-gray shade; some of them look as if the color of the surface-spots had "run" and soaked into the olivaceous-drab of the general surface.

436. **Limosa uropygialis,** GOULD.—*White-rumped Godwit.*

Limosa uropygialis, GOULD.—BD. Trans. Chicago Acad., i, 320, pl. 32, (1869.)—DALL and BANN. *Ibid.*, 293.—COUES. Key N. A. Birds, 258, (1872.)

This well-known Old World species, lately added to our Fauna, as above, is readily distinguished by the black and white barring of the upper tail-coverts. In winter the upper parts are pale gray, with dusky shaft-lines, and the under parts are nearly white—a condition never shown by our other species. In full plumage, the white of the rump and upper tail-coverts is more or less tinged with rusty, and the upper parts are brownish-black, everywhere variegated with rusty. Bills of different specimens before us range in length from $3\frac{1}{2}$ to $4\frac{1}{2}$ inches; those of the adults are mostly dark, but in the young fully the basal half is light-colored—dull whitish in the dried state.

Mr. Elliott did not take the eggs of this species, but two examples were secured by Mr. Dall, June 18, 1868, at Kutlik, Alaska. These differ as much from each other as eggs of this species do from those of other species. The ground of one is quite greenish-olive; of the other, pale olive-gray. In the former, the markings are all subdued neutral tints,

[1] The eggs were first discovered by Mr. Geo. R. Adams, agent of the Alaska Commercial Company, Saint George's Island. He, in order that they should be identified, notified Mr. Elliott of their position, who immediately shot the parent and secured the eggs. Mr. Elliott has had frequent occasion to acknowledge the courtesy and facilities for natural-history work furnished by the agents of the Alaska Commercial Company on both Islands, Dr. H. H. McIntyre and Mr. Adams, above mentioned. To the last-named gentleman he is especially indebted for many desiderata. Mr. Samuel Falconer, assistant agent, and Drs. Otto Cramer and Meany, physicians on the two Islands, are also among the few to whom Mr. Elliott's grateful obligations are due. From Dr. Cramer we have reason to anticipate a very valuable and interesting paper upon the stomach and intestinal parasites of the fur-seal, which he was engaged upon when Mr. Elliott took his departure from the Islands, August 10, 1873.

apparently in the shell; in the latter, the markings are nearly all on the surface, and quite bright chocolate-brown. In both cases the markings are numerous and of indeterminate shape, mostly small, and generally distributed, though tending to aggregate at the butt, where alone they lose their distinctness in coalescing to form a splashed area. Size, 2.20×1.45; 2.25×1.50.

"Migratory only, never breeding here. Comes in a straggling manner early in May, passing northward with little delay, and re-appears toward the end of August in flocks of a dozen to fifty."

440. **Heteroscelus incanus,** (GM.) COUES.—*Wandering Tattler.*

Scolopax incana, GMEL. Syst. Nat., i, 658, (1788.)—LATH. Ind. Orn., ii, 724, (1790.)
Totanus incanus, VIEILL. Dict. Deterv., vi, 400, (1816.)
Heteroscelus incanus, COUES. Key N. A. Birds, 261, (1872.)
Tringa glareola, PALL. Zoog. Rosso-As., ii, 194, pl. 60, (1811.)
Totanus brevipes, VIEILL. Dict. Deterv., vi, 400, (1816.)—CASS. Pr. A. N. S., viii, 40, (1856.)
Heteroscelus brevipes, BAIRD. B. N. A., 734, pl. 88, (1858.)—DALL. Tr. Chic. Acad., i, 293, (1869.)
Totanus fuliginosus, GOULD. Voy. Beagle; Birds, 130, (1841.)—GRAY. G. of B., iii, pl. 154.
Scolopax undulata, FORST. Descr. Anim., ed. Licht., 173, (1844.)
Totanus pulverulentus, MÜLL. Verhand., 153, (1844.)—SCHLEGEL. Fauna Japan, pl. 65.
Totanus oceanicus, LESS. Comp. Buff., 244, (1847.)
Totanus polynesiæ, PEALE. Voy. Vinc. and Peac.; Birds, 237, (1848.)
Totanus griseopygius, GOULD. B. Aust., vi, pl. 38.
Gambetta brevipes, fuliginosa, pulverulenta, oceanica, griseopygia, BONAPARTE.

Two specimens are contained in Mr. Elliott's collections.

Migratory regularly, but does not breed here. It comes every year early in June, and subsequently re-appears toward the end of July, when it may be obtained on the rocky beaches. It never visits the uplands, and is a very shy and quiet bird.

443. **Numenius borealis,** (FORST.) LATH.—*Esquimaux Curlew.*

This curlew only visits the Prybilov Islands in the same manner as the *Limosa*. It breeds, apparently in great numbers, in the Anderson River region, to judge from the numerous sets of eggs in the Smithsonian forwarded by Mr. R. Macfarlane. The usual nest-complement is four, made up usually the third week in June. The nest is placed on a barren plain, and made of decayed leaves placed under the eggs in a depression of the ground. The eggs vary to the great extent usual among waders. The ground is olive-drab, either tending more to green, to gray, or to brown in different instances. The markings are always numerous and bold, of the dark chocolate, bistre, and sepia browns of different depths, together with the usual stone-gray shell-markings. These always tend to aggregation at the larger end, or, at least, are more numerous

on the major half of the egg, though the distribution is sometimes nearly uniform, and in no instance is the small end entirely free from spots. In one set the large end is almost completely occupied by a dense confluence of very dark markings. The smallest, and at the same time shortest, egg measures only 1.90 × 1.40; the longest and narrowest, 2.12 × 1.33; an average egg is 2.00 × 1.45.

We may refer, in this connection, to a species of curlew lately ascertained to inhabit Alaska, as one which may be expected to occur also on the Prybilov Islands. This interesting addition to our Fauna is the *Numenius femoralis* of Peale—a species about as large as *N. hudsonicus*, and somewhat resembling it, but readily distinguished by the curious long bristly filaments which tip the abdominal feathers, and other characters. A male specimen was taken by F. Bischoff at Fort Kenai, Alaska, May 18, 1869, and is now in the Smithsonian. (See VIGORS, Zool. Journ., iv, 356; and Zool. Voy. Blossom, 28.)

A single specimen only of the Esquimaux curlew was taken by Mr. Elliott on Saint Paul's Island, June, 1872. None other than this one was seen by him.

482. **Philacte canagica,** (SEVAST.) BANN.—*Emperor Goose. Painted Goose.*

Anas canagica, SEVAST. Nov. Act. Acad. St. Peters., xiii, 346, pl. 10, (1800.)
Anser canagicus, BRANDT. Bull. Sc. St. Peters., i, 37, (1836.)—BRANDT. Descr. et Ic. An. Rosso-As., 7, pl. 1, (1836.)
Chloephaga canagica, BONAP. Comptes Rendus, (1856.)—BAIRD. B. N. A., 768, (1858.)—DALL and BANN. Trans. Chic. Acad., i, 296, (1869.)—DALL. Proc. Cala. Acad., (Feb., 1873.)
Philacte canagica, BANN. Proc. Phila. Acad., 131, (1870.)—COUES. Key, 283, (1872.)

A set of five eggs, taken by Mr. Dall in Kúselvak Slough, June 20, 1873, are much elongated and nearly equal at either end. The color is white, but with fine pale-brown dotting, giving a general light dirty-brown aspect. Specimens measure 3.33 × 3.10; 3.40 × 2.90, &c.

"Visits the Islands only as a straggler, sometimes landing so exhausted that the natives capture a whole flock in open chase over the grass, the birds being unable to use their wings for flight. I found the flesh of this bird, contrary to report, free from any unpleasant flavor, and, in fact, very good. The objectionable quality is only skin-deep, and may be got rid of by due care in the preparation of the bird for the table."

Mr. Dall's interesting note may be appended, in further illustration of the history of this species:

"This magnificent bird abounds in profusion in the Kúselvak Slough, or mouth of the Yukon, to the exclusion of all other species. My endeavors to reach that point being unavailing, I was obliged to do my best to obtain specimens elsewhere. It is quite scarce around the Kwichpak Slough and on the sea-coast. By offering a large reward, I obtained four fine specimens from the marshes around Kutlik. It is the largest of the geese of the country, and the delicate colors of the body, with the head and nape snow-white, tipped with rich amber-yellow, are a beautiful sight. The eye is dark-brown;

feet, flesh-color. The eggs are larger and longer than those of *A. gambeli*, and rather brown fulvous, the color being in minute dots. It lays on the ground, like the other geese. The Eskimo name is *Nachowth'luk.* The raw flesh and skin have an intolerable odor of garlic, which renders it a very disagreeable task to skin them, but when cooked this entirely passes away, and the flesh is tender and good eating.

"This goose arrives about June 1, or earlier, according to the season. As soon as the eggs are hatched the birds begin to moult. I saw half-moulted specimens at Pastolik, July 29, 1867. It remains longer than any other goose, lingering until the whole sea-coast is fringed with ice, feeding on *Mytilus edulis* and other shell-fish, and has been seen as late as November 1 by the Russians. It usually goes in pairs, or four or five together, rather than in large flocks. Its note is shriller and clearer than that of *A. gambeli* or *B. hutchinsi*, and it is shyer than the other geese, except the black brant."

According to Mr. Dall, the emperor goose does not occur in the Aleutian Islands from Unalashka eastward.

485 *a*. **Branta canadensis,** var. **leucopareia,** (BRDT.) COUES.—*White-collared Goose.* "Chornie Goose."

Anser canadensis, PALLAS, *nec auct.* Zoog. Rosso-As., ii, 230, (1811.)
Anser leucopareius, BRANDT. Bull. Ac. Acad. St. Petersb., i, 37, (1836.)—BRANDT. Descr. etIc. Anim. Rosso-As., 13, pl. 2, (1836.)
Bernicla leucopareia, CASSIN. Ill. 272, pl. 45, (1855.)—BD. B. N. A., 764, (1858.)—DALL. Trans. Chic. Acad., i, 295, (1869.)
Branta leucopareia, GRAY. Hand-list, iii, 76, No. 10580, (1871.)
Branta canadensis, var. *leucopareia*, COUES. Key, 284, Fig. 185 *b*, (1872.)

There is no reasonable question that this is anything more than a race of the common *B. canadensis.* The supposed specific characters, not very tangible at best, are not entirely constant.

According to Mr. Dall, this goose is abundant on the coast about the mouth of the Yukon, where it breeds, but it is rare at Nulato or farther inland. The eggs were obtained at Pastolik.

"Occasionally straggles to the Islands in small squads of ten to thirty, evidently driven by high winds from their customary line of migration along the main-land. Though not breeding here, it spends, occasionally, weeks at a time on the lakelets and uplands, before taking flight either north or south, as the season may be."

488. **Anas boschas,** (L.)—*Mallard.*

"A pair bred during the season of 1872, on Polavina Lakelet, St. Paul's Island, and several were observed later in the fall. The mallard was also noted on St. George's Island, but it is certainly not a regular visitor of either Island."

492. **Mareca penelope,** (L.) BP.—*Widgeon.*

It is an interesting fact that the widgeon which visits the Prybilov Islands is not *M. americana*, which would have been anticipated, but the true *M. penelope*, as Mr. Elliott's specimens attest.

"It is seldom seen, *never in pairs*, does not breed on the Islands, and apparently the few individuals noted during two years' observation were wind-bound or astray.

508. **Harelda glacialis,** (L.) LEACH.—*Long-tailed Duck.* "Saafka."

"Common, and resident. It breeds on the lakelets and sloughs of St. Paul's, in limited numbers.

"This is a very noisy bird, particularly in the spring, when, with the breaking up of the ice, it comes into the open reaches of water with its peculiar, sonorous, and reiterated cry of *ah-naah-năh-yah*, which rings cheerfully upon the ear after the silence and desolation of an ice-bound Arctic winter."

The eggs of this species, according to the sets before me, are six or seven in number, of the usual shape and smooth texture of shell; one set is more decidedly pale-greenish than the other, which is lighter, and rather gray, slightly inclining to creaminess. They measure 2.20 × 1.50, down to 1.90 × 1.40. One set was taken June 22, the other July 5.

510. **Histrionicus torquatus,** (L.) BP.—*Harlequin Duck.*

"Common on and around the Island shores, idly floating amid the surf in flocks of fifty or sixty, or basking and preening on the beaches and outlying rocks. It may be seen all the year round, excepting only when forced away by the ice-floes. Its nest, however, eluded my search; and, although I am quite confident that it breeds on either the rocky beaches or the high ridges inland, the natives themselves were equally ignorant of its eggs.

"My experience of this bird, it will be observed, differs from Mr. Dall's, who states that it 'is an essentially solitary species, found, alone or in pairs, only in the most retired spots, on the small rivers flowing into the Yukon, where it breeds.' (*Trans. Chicago Acad.*, i, 298.) I did not find it particularly wild or shy, and numbers are killed by the natives every fall or spring. It is a remarkably silent bird; I heard from it no cry whatever during the whole year. It is a most gregarious duck; solitary pairs never stray away from the flock. The females seem to outnumber the males, two to one."

511. **Somateria stelleri,** (PALL.) NEWT.—*Steller's Eider.*

Anas stelleri, PALL. Spic. Zool., vi. 35, pl. 5, (1769.)
Clangula stelleri, BOIE. Isis, 564, (1822.)
Fuligula stelleri, BP. Syn. B. U. S., 394, (1828.)
Macropus stelleri, NUTT. Man., ii, 451, (1834.)
Polysticta stelleri, EYTON. Hist. Brit. B., 79, (1836.)—BD. B. N. A., 801, (1858.)
Eniconetta stelleri, GRAY. List Gen. of B., 95, (1840.)
Harelda stelleri KEYS. et BLAS. Wirb. Europ., 230, (1840.)
Heniconetta stelleri, AGASS. Ind. Univ., 178, (1846.)
Somateria stelleri, NEWT. P. Z. S., 400, (1861.)—COUES. Key, 291, (1872.)

Anas dispar, SPARRM. Mus. Carls., pl. vii, viii, (1786.)
Fuligula dispar, STEPH. Shaw's Gen. Zool., xii, 206, (1824.)
Stelleria dispar, BP. Comp. List B. Eur. and N. A., 57, (1838.)
Anas occidua, BONN. et VIEILL. Ency. Met., i, 130, (1823.)

"A few of these ducks were observed, but not secured, on Saint Paul's, in the spring of 1812. Two were shot at the East Point, Saint George's, the same year. It is only a straggler."

As several experienced ornithologists have stated, Steller's duck is a true eider in all essential respects. Various views of its systematic position which have been entertained are indicated by the foregoing synonymy.

An egg of Steller's duck, in the Smithsonian, from the Petersburg Museum, through H. E. Dresser, esq., collected in Kamtschatka, measures 2.20 × 1.60, and is like that of the common eider in shape, color, and texture of shell.

534. **Graculus bicristatus,** (PALL.) GRAY. *Red-faced Cormorant.* "Oreel."

? Red-faced Cormorant or *Shag*, PENNANT & LATHAM. (Arct. Zool. 11, 584; Gen. Syn. vi, 601. Kamtschatka.)
? Pelecanus urile, GM. Syst. Nat. 1, 575, (1788.)—LATH. Ind. Orn. ii, 888, (1790.)
Phalacrocorax bicristatus, PALL. Zoog. Rosso.-As., ii, 301, pl. 75, f. 2, (1811.)
Graculus bicristatus, GRAY. Gen. of Birds. Hand-list, iii, 128, No. 11129.—BD. Tr. Chic. Acad. 1, 321, pl. 33, (1869.)—DALL. & BANN. *Ibid.*, 302.—COUES. Key, 304, (1872.)
Urile bicristatus, BP., *partim.* Comp. Av. 11, 175, (1851.)
"*Phalacrocorax pelagicus*, PALL." Zoog. Rosso.-As., ii, 303, pl. 76, (1811.)

The cormorant which swarms on the Prybilov Islands appears to be unquestionably the bird of Pallas, which is most probably the red-faced cormorant, *P. urile*, of earlier authors. In adult plumage it is readily recognized by the naked red skin which entirely surrounds the base of the bill, somewhat carunculate, and the blue base of the under mandible, as well as by the other points noticed in the later treatises above quoted. In the great confusion subsisting among authors respecting the North Pacific cormorants, we do not venture to cite several names more or less probably synonymous.

Several eggs of this cormorant brought in by Mr. Elliott are covered with the white, chalky incrustation, in a maximum amount of depth and irregularity, the shell being very pale bluish beneath. They measure about 2½ inches long by 1½ wide, being thus narrowly elongate, though little more pointed at one end than at the other. They are all much soiled with the filth of the nest.

"This cormorant, the only one of its tribe visiting the Seal Islands, is a common bird, and is found the whole year round. The terrible storms in February and March are unable to drive the shag away from the sheltered cliffs of the Island, while all other species, even the big northern gull, depart for the open water south.

"It comes on to the cliffs to make its nest and lay, the earliest of the birds in this sea. Two eggs were taken from a nest on the reef, Saint Paul's Island, June 1, 1872, which is over three weeks in advance of the other water-fowl, almost without exception. The nest is large, carefully rounded up and built upon some jutting point or narrow shelf along the face of a cliff or bluff; in its construction sea-ferns, *(Sertularidæ,)* grass, &c., are used, together with a cement made largely of their excrement.

"The eggs are usually three in number, sometimes four, and, compared with the size of the bird, are very small. They are oval, of a dirty, whitish-gray, green, and blue color, but soon become soiled; for although the bird's plumage is sleek and bright, yet it is exceedingly slovenly and filthy about the nest. The young come from the shell at the expiration of three weeks' incubation, without feathers, and almost bare even of down. They grow rapidly, being fed by the old birds, who eject the contents of their stomachs, such as small fish, crabs, and shrimps, all over and around the nest. In about six weeks the young cormorant can take to its wings, being then fully as large and heavy as the parents; but it is not until the beginning of its second year that it has the bright plumage and metallic gloss of the adult, wearing, during the first year, a dull drab-brown coat, with the brilliant colors of the base of the bill and gular sac subdued.

"This shag is a bold and very inquisitive bird, and utters no sound whatever except when flying over and around a boat or ship, which apparently has a magnetic power of attraction for them. When they are hovering and circling around in this way, I have heard a low, droning croak come from them.

"The cormorant cannot be called a bird of graceful action at any place, either on the wing or on shore. Its flight is a quick beating of the wings, (which are usually more or less ragged,) with the neck and head stretched out horizontally to the full length. It is exceedingly inquisitive, flying around again and again to satisfy its curiosity, but never alighting on a boat or ship, though coming close enough sometimes to be almost touched by hand. It is very dirty on the rocks, and does not keep its nest in tidy trim like the gulls; but in regard to its plumage it cannot be surpassed, or even equalled, by any bird of Behring Sea, for brilliant gloss and glittering sheen. It fairly shimmers when in the sunlight, with deep bronze and purple reflections, as though clothed in steel armor.

"In their stomachs I have found, almost invariably, the remains of small fish and a coil of worms, (*Nematoda.*)

"As this bird is found during the whole winter, in spite of severe weather, perched on the sheltered bluffs, the natives regard it with a species of affection, for it furnishes the only supply that they can draw upon for fresh meat, soups, and stews, always wanted by the sick; and were the shags sought after throughout the year, as they are during the short spell of intensely bitter weather that occurs in severe winters, driving the other water-fowl away, they would certainly be speedily exterminated. They are seldom shot, however, when anything else can be obtained."

Diomedea brachyura, TEMM.—*Short-tailed Albatross.*

"Twenty or thirty years ago, when whaling-vessels were reaping their rich harvests in Behring and the Arctic Seas, the albatross was often seen about the Islands, feeding upon the whale-carrion which might drift on shore. But, with the decrease of the whale-fishery, the birds have almost disappeared. Only a single individual was noted during my two years' residence. This was taken by Dr. Meany, on the north shore of Saint George's.

"It is common around Ounalaska Island, where I saw a large number on my way to San Francisco, in August, 1873."

582*a*. **Fulmarus glacialis** var. **rodgersi,** (CASS.) COUES.—*Rodger's Fulmar.* "Lupus."

Fulmarus rodgersii, CASS. Proc. Phila. Acad., 290, (1862.)—COUES. *op. cit.*, 29, (1866.)—BAIRD. Tr. Chicago Acad., i, 323, pl. 34, fig. 1, (1869.)—DALL et BANN. *Ibid.*, 303.

Fulmarus glacialis var. *rodgersi*, COUES. Key N. A. Birds, 327, (1872.)

Distinguished from the ordinary fulmar by the restriction of the darker slate-gray mantle, most of the wing-coverts and some of the secondaries being white.

An egg of this fulmar, procured by Mr. Elliott, is much more elongate than the only specimen of *F. glacialis* before me, and the shell is even rougher than in the latter, with innumerable raised points and minute fossæ. It measures 2.90 in length by 1.90 in breadth, and is scarcely more pointed at one end than at the other. The color is white, much soiled, in this instance, with adventitious yellow discoloration. The description applies to the whole of a large series examined.

"This is the only representative of the *Procellarinæ* I have seen on or about the Prybilov Islands. It repairs to the cliffs on the south and east shores of Saint George's in greatest number, coming up early in the season, and selecting some rocky shelf secure from all enemies save man, where, making no nest whatever, it lays a single large, white, oblong-oval egg, and immediately commences the duty of incubating. It is one of the most devoted of all water-fowl to its charge, for it will not be scared from the egg by any demonstration that may be made in the way of throwing rocks or yelling, and will even die as it sets rather than take to flight, as I have frequently witnessed.

"The fulmar lays by 1st to 5th of June. The egg is very palatable, fully equal to that of our domestic duck—even better. The natives lower themselves over the cliffs and gather a large number of eggs every season on Saint George's Island.

"The Lupus never flies in flocks; it pairs early, and is then exceedingly quiet. I have never heard it utter a sound, save a low, droning croak, when disgorging food for its young.

"The chick comes out a perfect puff-ball of white down, gaining its first plumage in about six weeks. It is a dull gray, black at first, but by the end of the season it becomes like the parents in coloration, only much darker on the back and scapularies.

"They are the least edible of all the birds about the Islands. Like others of the family, they vomit up the putrid contents of their stomachs upon the slightest provocation."

540. **Stercorarius pomatorhinus,** VIEILL.—*Pomarine Jäger.* "Raz-boi-nik."

Larus parasiticus, MEY. et WOLF. Tasch. Deutsch., 11, 490, (1810.)
Larus crepidatus, GM. L. N., i, 602, (1788.) (Qu. tes *Sterc. striatus* BRISS.)
Lestris striatus, EYTON. Br. Birds, 53.
Stercorarius pomarinus, VIEILL. Nouv. Dict. d'Hist. Nat., xxxii, 158, (1819.)—COUES. Proc. Phil. Acad., 129, (1863.)
Stercorarius pomatorhinus, COUES. Key, 309, (1872.)
Cataractes pomarinus, STEPH. Gen. Zool., xiii, 216, pl. 24, (1825.)
Coprotheres pomarinus, REICH, Syst. Av., 52, (1580.)
Cataractes parasita var. *camtschatica*, PALLAS. Zoog. Rosso.-As., ii, 312, (1811.)

"A rare visitor. The specimen secured was the only one seen on the Islands. It was found on the high, mossy uplands, perched in a listless attitude on a tussock of grass."

541. **Stercorarius parasiticus,** (BRÜNN.) GRAY.—*Parasitic Jäger.*

Catharacta parasitica, BRÜNN. Orn. Bor., 37, (1764.)
Larus parasiticus, LINN. Syst. Nat., i, 226, (1766.)
Cataractes parasita, PALL. Zoog. R. A., ii, 310, (1811.)
Lestris parasita, ILLIGER. Prod., 273, (1811.)
Lestris parasitica, KEYS et BLAS. Wirb. Eur., 1, 240, (1840.)
Stercorarius parasiticus, GRAY. Gen. of B., 10, 652, (1849.)—LAWR. B. N. A., 839, (1858.)—COUES. Pr. Phila. Acad., 133, (1863.)—DALL et BANN. Tr. Chicago Acad., i, 303, (1869.)
Lestris richardsoni, SW. F. B. A., 11, 433, pl. 73, (1831.)
Stercorarius richardsoni, COUES. Proc. Phila. Acad., 135, (1863.)
Cataractes richardsoni, MACGILLIVRAY. Man. Orn., ii, 257, (1842.)
Catharacta coprotheres, BRÜNN. Orn. Bor., 38, (1764.)
Lestris coprotheres, DESMURS. Traité Oöl., 551, (1860.)
Stercorarius crepidatus, VIEILL. Nouv. Dict., xxxii, 155, (1819.) (Not of Gmelin.)
Lestris crepidata, DEGLAND, Mem. Soc. Roy. Lille, 108, (1838.)
Stercorarius cepphus, SW. F. B. A., ii, 432, (1831.)
Lestris hardyi et spinicauda, BP. Consp. Av. ii, 210, (1856.)

"I have seen but four or five examples of this species, which may be rated as an infrequent visitor. It may be found upon the grassy uplands, where it will alight and stand dozing in an indolent attitude for hours. No one of the three species of *Stercorarius* was observed to breed here."

"Numerous eggs of this species from the barren grounds of the Anderson River region, and the Arctic coast to the eastward, offer the following characters: The ground color is as various, and of the same shades, as that already mentioned under head of *Numenius borealis*, and in fact the whole aspect of the egg, markings included, is quite similar. But although pointed, they have not the peculiar pyriform shape usual among *Limicolæ*. I find no specimens heavily marked at the butt, though the tendency is to a wreath by confluence around the larger end. In some specimens the markings are all small and scratchy, and distributed with "uniform irregularity" over the whole surface. A certain proportion of stone-gray shell-markings always appears to accompany the various chocolate and other browns of the surface. Specimens range from 2.40 × 1.70 to 2.00 × 1.50, averaging nearer the former dimension.

The eggs of the next species cannot be distinguished from those of the present with certainty, since, though they average less in size, the larger specimens overlap the measurements of even average *parasiticus*. A fair specimen is 2.10 × 1.50; the smallest examined measured only 1.90 × 1.40.

542. **Stercorarius buffoni,** (Boie.) Coues.—*Long-tailed Jäger.*

(?) *Catharacta cepphus*, Brünn. Orn. Bor., 36, (1764.)
Lestris cepphus, Keys. et Blas. Wirb. Eur., i, 240, (1840.)
Stercorarius cepphus, Gray. Gen. of B., iii, 652, (1849.)—Lawr. B. N. A., 840, (1858.)—Coues. Proc. Phila. Acad., 243, (1861.)
(?) *Harus parasiticus*, Lath. Ind. Orn., ii, 819, (1790.)
Lestris parasiticus, Temm. Man. Orn., iv, 501, (1840.)—Sw. & Rich. F. B. A., ii, 430, (1831.)
Stercorarius longicandatus, Brisson.—Vieill. Nouv. Dict., xxxii, 157, (1819.)
Lestris longicaudatus, Thomp. Nat. Hist. Ireland, iii, 399, (1851.)
Cataractis longicaudatus, Macgill. Man. Orn., ii, 258, (1842.)
Lestris buffoni, Boie. Isis, 562–576, (1822.)
Stercorarius buffoni, Coues. Proc. Phila. Acad., 136, (1863.)—Dall et Bann. Trans. Chic. Acad., i, 304, (1869.)—Coues. Key N. A. Birds, 310, (1872.)
Lestris lessoni, Degland. Mem. Soc. Roy. Lille, (1838.)
Lestris crepidata, Brehm. Naturg. Eur. Vog., 747, (1823.)

"Seldom seen. The specimen in my collection is one of the only two I ever observed on the Islands. When I came upon them, July 29, 1872, they were apparently feeding upon insects, and upon a small, black berry which ripens on the highlands," (the fruit of the *Empetrum nigrum.*)

543. **Larus glaucus,** Brünn.—*Glaucous Gull. Burgomaster.* "Chikie."

"This large, handsome bird is restricted by choice to Walrus Island alone, although it comes sailing over and around all the Islands, in easy, graceful flight, every hour of the day, and frequently, late in the fall, will settle down by hundreds

upon the carcasses on the killing-grounds. But upon Walrus Island this bird is at home, and there lays its eggs in neat nests, built of sea-ferns and dry grass, placed among the grassy tussocks on the centre of the Island.

"It remains by the Islands during the whole season. Though it is sometimes driven by the ice to the open water fifty to a hundred miles south, it returns immediately after the floe disappears.

"The 'chikie' lays as early as the 1st to 4th of June, depositing three eggs, usually within a week or ten days. These eggs are large, spherically oval, having a dark grayish-brown ground, with irregular patches of darker brown-black. They vary somewhat in size, but the shape and pattern of coloring is quite constant.

"The young *burgomaster* comes from the shell at the expiration of three weeks' incubation, in a pure white, thick coat of down, which is speedily supplanted by a brownish-black and gray plumage, with which the bird takes flight, having nearly the size of the parent. This dark coat changes within the next three months to one nearly white, with the lavender-gray back of the adult; the legs change from a pale-grayish tone to the rich yellow of the mature condition, and the bill also passes from a dull-brown color to a bright-yellow, with a red spot on the lower mandible.

"It has a loud, shrill cry, becoming soon very monotonous by its constant repetition, and also utters a low, chattering croak while coasting.

"It is a very neat bird about its nest, and keeps its plumage in a condition of snowy purity. It is not very numerous; I do not think that there were more than five or six hundred nests on Walrus Island at the time of my visit, in 1872."

552. **Larus tridactylus** var. **kotzebui,** (Bp.) Coues.—*Pacific Kittiwake.* "Chornie-naushkie goverooskie."
Rissa kotzebui, Bp. Consp. Av., 11, 226, (1856.)—Coues. Pr. Phila. Acad., 305, (1862.)—Coues. Pr. Phila. Acad., 207, (1869.)
Larus tridactylus, Dall & Bann. Tr. Chic. Acad., 1, 305, (1869.)
Larus tridactylus var. *kotzebui*, Coues, Key, 314, (1872.)

We have called attention, in our publications above quoted, to the fact that the North Pacific Kittiwake has the hind-toe better formed than that of the Atlantic bird; and this is the sole basis of the supposed species.

Although thus so similar to the true *Larus tridactylus* that it cannot be specifically distinguished, and also totally distinct from the next species, there has been a strange confusion regarding it. I do not venture now to add to the foregoing synonymy several names more or less doubtfully here applicable. Bonaparte quotes as synonymous, *Rissa nivea* of Bruch, J. f. O., 1855, 285; and also queries *R. brachyrhyncha*, of Bruch, *Ibid.*, 1853, 103. No one of the four species of *Rissa* described by Mr. Lawrence, in 1858, in Baird's work, pp. 854, 855, belongs here.

"This Kittiwake breeds here by tens of thousands, in company with *R. brevirostris*, coming at the same time, but laying a week or ten days earlier; in all other respects it corresponds in habit, and is in just about the same number. It is a

remarkably constant bird in coloration, when adult, for I have failed to observe the slightest variation in plumage among the great numbers here under my notice.

"In building its nest it uses more grass and less mud-cement than the *brevirostris* does. The eggs are more pointed at the small end and lighter in the ground color, with numerous spots and blotches of dark-brown. The chick is difficult to distinguish with certainty from the *brevirostris*, and it is not until two or three weeks have passed that any difference can be noted in the length of bill and color of feet.

"Like *Rissa brevirostris*, the male treads the female on the nest, and nowhere else, making a loud, shrill, screaming sound during the ceremony."

553. **Larus brevirostris,** (BRANDT.)—*Short-billed* or *Red-legged Kittiwake.* "Goverooskie."

Rissa brevirostris, BRANDT.—LAWR. B. N. A., 855, (1858.)—DALL & BANN. Tr. Chicago Acad., i, 305, (1869.)
Larus brevirostris, COUES. Key N. A. Birds, 315, (1872.)
Larus brachyrhynchus, GOULD. P. Z. S., (July 25, 1843.)—GOULD. Voy. Sulphur, 50, pl. 34, (——.) Not of RICHARDSON.
Rissa brachyrhyncha, BP. Consp. Av., ii, 226, (1856.)—COUES. Proc. Phila. Acad., 306, (1862.)
Rissa nivea, LAWR. B. N. A., 855, (1858.) (Excl. Syn. Not *Larus niveus*, PALL.)

This excellent species will instantly be distinguished from the preceding by its short bill, and especially by its rich coral, vermilion, or lake-red legs, (drying straw-yellow.) There is no possibility of confounding the two, although their synonymy has become involved to such an extent that the task of disentangling it is almost hopeless. The names above quoted are of unquestionable pertinence here; several others that might be quoted are preferably left untouched.

"This beautiful gull, one of the most elegant of birds on the wing, seems to favor these Islands with its presence to the exclusion of other land, coming here by tens of thousands to breed. It is especially abundant on Saint George's Island. It is certainly by far the most attractive of all the gulls, its short, symmetrical bill, large hazel eye, with crimson lids, and bright-red feet, contrasting richly with the snowy-white plumage of the head, neck, and under parts.

"Like *Larus glaucus*, this bird remains about the Islands during the whole season, coming on the cliffs for the purpose of nest-building, breeding by the 9th of May, and deserting the bluffs when the young are fully fledged and ready for flight, early in October.

"It is much more cautious and prudent than the 'arrie,' for its nests are placed on almost inaccessible shelves and points, so that seldom can a nest be reached unless a person is lowered down to it by a rope passed over the cliff.

"Nest-building is commenced by this bird early in May, and completed, usually, not much before the first of July. It uses dry grass and moss, cemented with mud, which it gathers at the margins of the small fresh-water sloughs and ponds scattered over the Islands. The nest is solidly and neatly put up, the parent birds working in the most diligent and amiable manner.

"Two eggs are the usual number, although occasionally three will be found in the nest. If these eggs are removed, the female will renew them, like the 'arrie,' in the course of another week or ten days. They are of the size and shape of the common hen's egg, but colored with a dark-gray ground, spotted and blotched with sepia-brown patches and dots. Once in a while an egg will have on its smaller end a large number of suffused blood-red spots.

"Both parents assist in the labor of incubation, which lasts from twenty-four to twenty-six days. The chick comes out with a pure-white downy coat, and pale whitish-gray bill and feet, resting helplessly in the nest while its feathers grow. During this period it is a comical-looking object; the natives capture them now, and pet them, having a number every year scattered through the village, where they become very tame, and it is not until fall, when cold weather sets in and makes them restless, that they leave their captors and fly away to sea.

"This bird is very constant in its specific characters. Among thousands of them I have never observed any variation in the coloration of the bills, feet, or plumage of the mature birds, with one exception. There is a variety, seldom seen, in which the feet are nearly yellow, or rather yellow than red, and the edge of the eye-lid is black instead of scarlet; there is also a dark patch back of each eye. The color of the feet is probably an accidental individual peculiarity; the dark eye-patch and absence of bright color from the eye-lids may depend upon season."

606. **Colymbus arcticus,** (L.)—*Black-throated Diver.*

It is interesting to observe that this bird is the true *C. arcticus*, and not var. *pacificus*, which might have been expected to occur. This is sufficiently attested by the measurements of a fine adult specimen, No. 498 of Mr. Elliott's collection. Length, about 31 inches; wing, 12; bill, along culmen, $2\frac{3}{4}$; along gape, 4; its depth at base, .80; tarsus, $3\frac{1}{8}$; middle toe and claw, 4. The bill is quite stout, with the culmen convex throughout, showing nothing of the slender, straight, or almost recurved shape characteristic of var. *pacificus.*

We find nothing respecting this species in Mr. Elliott's MSS. It was the only one seen by him. It was found dead, cast upon the sand-beach at Zapadnee, Saint George's Island, and brought to Mr. E. by the natives, who differed among themselves as to whether they had ever noticed it before about the Islands. At all events, it is seldom seen there.

610. **Podiceps griseigena,** (Bodd.)—*Red-necked Grebe.*

As in the case of the last species, the present is of the typical form rather than of the North American variety. The difference, as stated in our synopsis, (Pr. Phila. Acad., 1862, 232,) lies in the size and coloration of the bill. In true *griseigena* the bill is little, if any, over 1.50 inches along the culmen, or 2.00 along the gape, and the yellow is either entirely restricted to the base or only extends thence a little on the edge of the under mandible. In var. *holbölli* the above-mentioned measurements of the bill are respectively 1.90 and 2.40, and much or most of the under mandible, with the cutting-edges of

the upper, are yellow. In the present specimen the culmen measures 1.60, the gape 2.15, and there is little yellow, excepting at the base of the bill.

Eggs of the American Red-necked Grebe, from the Yukon and other interior Arctic localities, are rough, white, either inclining to pale-greenish or with buffy discoloration, and of the usual narrowly-elongate shape common in the family. They measure from 2.10 to 2.35 in length by 1.25 to 1.45 in breadth, the longer eggs not always being proportionally wide.

"It is the only specimen seen during my residence upon the Islands. It has been observed before by the natives, who, however, affirm that it is uncommon."

617. **Fratercula corniculata,** (NAUM.) BRANDT.—*Horned Puffin.* "Epatka."

(?)*Alca arctica*, var. B., LATH. Ind. Orn., ii, 792, (1790.)
Lunda arctica, PALL. *partim.*, Zoog. R. A., ii, 365, (1811.)
Mormon corniculatum, NAUM. Isis, 782, pl. 7, f. 3, 4, (1821.)—KITTL. Kupf. Naturg. Vog. pl. i, fig. 1.—DALL & BANN. Trans. Chic. Acad., i, 308, (1869.)
Mormon (*Fratercula*) *corniculata*, BP. Comptes Rendus, 774, (1856.)—CASS., in Bd. B. N. A., 902, (1858.)
Fratercula (*Ceratoblepharum*) *corniculata*, BRANDT. Bull. Sc. Acad. St. Petersb., ii, 348, (1837.)
Fratercula corniculata, GRAY. Gen. B., iii, 637, pl. 174, (1849.)—COUES. Pr. Phila. Acad., 1868.—COUES. Key, 340, (1872.)
Lunda corniculata, SCHLEGEL. M. P. B., ix, *Nerin.*, 28, (1867.)
Lunda (*Ceratoblepharum*) *corniculata*, BRANDT. Bull. Sc. Acad. St. Petersb., vii, 242, (1869.)
Mormon glacialis, GOULD, *nec.* LEACH. B. Eur., v, pl. 404, (1837.)—AUD. Orn. Biog., iii, 549, pl. 293, (1835.)—ID. B. Amer., vii, 236, pl. 463.

An egg before me is noticeably more elongate than that of *F. arctica* or of *F. cirrhata*, though not more pointed. The shell is rather rough and dead-white. We may anticipate that in some instances a few obscure obsolete spots may appear, as they occasionally do in the eggs of *F. arctica*, and, doubtless, also show the usual discolorations in many cases. The present specimen measures 2.75 by 1.75.

"The eye never fails to be arrested by this odd-looking bird, with its great, shovel-like, lemon-yellow and red bill, as it sits squatted in glum silence on the rocky cliff-perches, regarding approach with an air of stolid wonder. It seems to have been fashioned with especial regard to the fantastic and comical.

"This *mormon*, in common with one other species, *M. cirrhata*, comes up from the sea, from the south, to the cliffs of the Islands about the 10th of May, always in pairs, never coming or going in flocks. It makes a nest of dried sea-ferns, grass, moss, &c., far back or down in some deep, rocky crevice, where the egg when laid is generally inaccessible—nothing but blasting-powder would reach it.

"It lays but a single egg, large, oblong-oval, pure white, and, contrary to the custom of the gulls, arries, choochkies, &c., when the egg is removed the sea-parrot does not renew it, but deserts the nest, perhaps locating elsewhere. The young

chick I have not been able to get—not until it comes out fledged and ready for flight, in August, when it does not differ materially from its parent. The species leaves the Islands about the 10th September.

"This bird is very quiet and unobtrusive; it does not come in large numbers to the Islands, for it breeds everywhere else in Behring Sea. Its flight is performed with quick and rapid wing-beats, in a straight and steady course. There is no difference between the sexes as to size, shape, or plumage."

619. **Fratercula cirrhata,** (PALL.) STEPH.—*Tufted Puffin.* "Tawpawkie."

Alca cirrhata, PALL. Spic. Zool., 7, pl. 1, ii, fig. 1, 2, 3, (1769.)
Lunda cirrhata, PALL. Zoog. R. A., ii, 363, pl. 82, (1811.)—SCHLEG. Mus. Pays-Bas., *Urin.* 27, (1867.)—COUES. Pr. Phila. Acad., (1868.)
Lunda (*Gymnoblepharum*) *cirrhata*, BRANDT. Bull. Sc. St. Petersb., vii, 244, (1867.)
Fratercula cirrhata, STEPH. Shaw's Gen. Zool., xiii, 40, (1825.)
Fratercula (*Gymnoblepharum*) *cirrhata*, BRANDT. Bull. Sc. St. Petersb., ii, 349, (1837.)
Mormon cirrhata, NAUM. Isis, 781, pl. 7, f. 1, (1821.)—CASS. B. N. A., 902, (1858.)—DALL & BANN. Trans. Chicago Acad., i, 308, (1869.)
Fratercula carinata, VIGORS. Zool. Journ., iv, 358.
Sagmatorhina lathami, BP. P. Z. S., 202, pl. 44, (1851.)—COUES. Pr. Phila. Acad., (1868.)
Sagmatorhina labradoria, CASS. B. N. A., 904, (1858.)—DALL & BANN. Trans. Chic. Acad., i, 309, (1869.)

As Professor Brandt showed, shortly after the publication of our Monograph, the *Sagmatorhina lathami* of Bonaparte (=*S. labradoria*, Cass.) is merely the young of this species, at an age before the bill has attained its final shape and coloring. Of this fact we became ourselves aware about the same time, from examination of various specimens in the Smithsonian.

The genus, of course, falls, as well as the species. In our Monograph we were so far wrong as to assign to it a second supposed species, the *Cerorhina suckleyi*, of Cassin, which is the young of *Ceratorhina monocerata.*

"Comes to the Islands at the same time as *F. corniculata*, and resembles the *Epatkie* in its habits generally. It lays a single large white egg, of a rounded-oval shape. I was never able to see a newly-hatched chick, owing to the retired and inaccessible nature of the breeding-places. Could Walrus Island be visited frequently during the season, interesting observations might be made there, for the nests are more easy of access. The young tawpawkie, six weeks old, resembles the parents exactly, only the bill is lighter colored, and the plumes on the head are incipient. This is the only place where the birds can be daily seen and watched with satisfactory results. I took eggs from over thirty nests in July. The natives say it is very quarrelsome when mating, its cries sounding like the growling of a bear as they issue from far down under the rocks that cover its nest."

The egg is much thicker and more capacious than that of *F. corniculata*, though no longer. The shell is rough, dead-

white, and, besides the frequent discolorations, shows in several specimens very pale, obsolete shell-markings of purplish-gray. Several specimens measure as follows: 2.85×1.95; 2.80×1.92; 2.75×2.00; 2.65×1.95.

621. **Phaleris psittacula,** (ESCH.) TEMM.—*Parroquet Auk.* "Baillie Brushkie."

Alca psittacula, PALL. Spic. Zool., fasc. v, 13, pl. 2, pl. 5, f. 4, 5, 6, (1760.)

Lunda psittacula, PALL. Zoog. Rosso-As., ii, 366, pl. 84, (1811.)

Phaleris psittacula, TEMM. Man. Orn., i, 112, (1820.)—COUES. Key N. A. Birds, 342, fig. 222, (1872.)

Ombria psittacula, ESCHSCH. Zool. Atlas, iv, 3, pl. 17, (1831.)—BRANDT. Bull. Sc. Acad. St. Petersb., ii, 348, (1837.)—ID. *Ibid.* vii, 237, (1869.)—CASS. B. N. A., 410, (1858.)—ELLIOT. B. N. A., pt. i, pl. 70.

Simorhynchus psittaculus, SCHLEG. Mus. Pays-Bas., ix, 24, (1867.)—COUES. Proc. Phila. Acad., (1868.)

Not only on account of the form of the bill, which, though singular among *Alcidæ*, is not more different from that of some others than these are among themselves, but also in consequence of a different mode of life, to which the shape of the bill fits it, as attested by various observers, we now place the bird in a separate genus from *Simorhynchus*, under which we formerly included it. The species is said to live chiefly upon bivalve molluscs, such as *Mytilus*, &c., for opening which its bill is adapted; and Professor Brandt notes the curious analogy afforded, in this respect, with *Hæmatopus*, as compared with allied Charadrine genera.

Mr. Gray adduces a reference to the unexpected occurrence of this species in Sweden.

"This quaintly-beaked bird is quite common on the Prybilov Group, and can be obtained at Saint George's in considerable numbers. It comes here early in May, and locates in a deep chink or crevice of some inaccessible cliff, where it lays a single egg and rears its young. It is very quiet and undemonstrative during the pairing-season, its only note being a low, sonorous, vibrating whistle. Like *Simorhynchus cristatellus*, it will breed in company with the 'choochkie,' but will not follow that lively relative back upon the uplands, the 'baillie brushkie' being always found on the shore-line, and there only.

"The egg, which is laid upon the bare earth or rock, is pure white, oblong-ovate, measuring 2½ by 1½ inches. It is exceedingly difficult to obtain, owing to the birds' great caution in hiding, and care in selecting some deep and winding crevice in the face of the cliff. At the entrance to this nesting-cavern the parents will sometimes squat down and sit silently for hours at a time, if undisturbed.

"It does not fly about the Islands in flocks, and seems to lead a quiet, independent life by itself, caring nothing for the society of its kind. The young, when first hatched, I have not seen, but by the 10th to the 15th of August they may be observed coming out for the first time from their secure retreats, and taking to wing as fully fledged and as large as their parents.

"They take their departure from the 20th of August to the 1st of September, and go out upon the North Pacific for the winter, where they find their food, which consists of *amphipoda* and fish fry. I have never seen one among the thousands

that were around me when on the Islands 'opening' the bivalve-shells, such as mussels, &c., as stated by Professor Brandt. It feeds at sea, flying out every morning, returning in the afternoon to its nest and mate."

The egg of *Phaleris psittacula* is about as large as a small hen's egg, which it resembles, although averaging more elongate. The shape, however, is extremely variable; thus, one measures 2.25 by 1.50, and another 2.35 by only 1.45, the latter being remarkably narrow, elongate, and pointed. The shell is minutely granular, and rough to the touch. It is white, unmarked, but often found variously soiled and discolored, sometimes by mechanical effect, and sometimes by fluids of the oviduct or cloaca. Mr. Elliott says, "So effectually do these birds secrete their eggs in the deep recesses of cliff crevices and chinks that I was unable to obtain more than four perfect specimens, although several hundred 'baillie-brushkies' were breeding on the cliffs, each pair marked by myself, (in daily observation,) close by the village, at Saint George's Island, during the summer of 1873. Nothing, save blasting-powder, or similar agency, can open the basaltic crevices in which the bird hides, and, of course, resort to this action would also destroy the egg."

622. **Simorhynchus cristatellus,** (PALL.) MERR.—*Crested Auk.* "Canooskie."

Alca cristatella, PALL. Spic. Zool. fasc., v., 20, pl. 3, pl. 5, figs. 7, 8, 9, (1769.)
Uria cristatella, PALL. Zoog. Rosso.-As., ii, 370, (1811.) (Excl. syn. *Alca camtschatica*, LEPECH.)
Simorhynchus cristatellus, MERREM.—SCHL. M. P.-B., ix, 25, (1867.)—COUES. Proc. Phila. Acad., (1868.)—COUES. Key N. A. Birds, 342, figs. 223, 224, (1872.)
Simorhynchus (Tylorhamphus) cristatellus, BRANDT. Bull. Sc. Acad. St. Petersb., vii, 223, (1869.)
Tylorhamphus cristatellus, BRANDT. Op. cit., ii, 348, (1837.)
Phaleris cristatellus, STEPH. Shaw's Gen. Zool., xiii, 47, pl. 5, (1825.) (Nec TEMM.)—SCHRENCK. Reise Amur-Land, i, vt. ii, 500, pl. 16, figs. 4, 5.
Phaleris (Simorhynchus) cristatellus, CASS. B. N. A., 906, (1858.)
Uria dubia, PALL. Zoog. R.-A., ii, 371, (1811.)—(*Avis ptil. hyem. vestita, sec.* BRANDT.)
Phaleris dubia, BRANDT. Bull. Sc. Acad. St. Petersb., ii, 347, (1837.)
Tylorhamphus dubius, BONAP. Comptes Rendus, xlii, 774, (1856.)
Simorhynchus dubius, COUES. Proc. Phila. Acad., (1868.)
Alca tetracula, PALL. Spic. Zool. fasc. v., 23, pl. 4, (1769,) (*Junior.*)
Uria tetracula, PALL. Zoog. R.-A., ii, 371, (1811.)
Phaleris tetracula, STEPH. Gen. Zool. xiii, 46, (1825.)—BRANDT. Bull. Sc. Acad. St. Petersb., ii, 347, (1837.)
Tylorhamphus tetraculus, BONAP. Comptes Rendus, xlii, 774, (1856.)
Phaleris (Tylorhamphus) tetracula, CASS. B. N. A., 907, (1858.)
Simorhyncus tetraculus, COUES. Proc. Phila. Acad., (1868.)—COUES. Key N. A. B., 342, (1872.)
Phaleris psittacula, TEMM. Man. d'Ornith., i, p. cxii, (1820.)
Phaleris superciliata, AUD. Orn. Biog., iv, pl. 402, (1839.) (Nec LICHT.; nec BP.)

"This fantastic-looking bird, conspicuous by reason of its curling crest and bright crimson bill, breeds in company

with the *S. microceros*, but in no number whatever compared with the 'choochkie'—a few thousand pairs only at Saint Paul's, and relatively more on Saint George's, of course.

"It makes its appearance early in May, and repairs to chinks and holes in the rocky cliffs, or deep down under large boulders and rough basaltic shingle, to lay, making no nest whatever, depositing the egg upon the bare earth or rock. But so well do these birds succeed in secreting it that, although I was constantly upon the ground where several thousand pairs were laying, I was unable to successfully overturn the rocks (under which they hide) and get more than four eggs, the result of over a hundred attempts.

"The note of the 'canooskie' while mating is a loud clanging, *honk*-like sound; at all other seasons they are silent.

"The *Simorhynchus cristatellus* lays but one egg, and the parents take turns, I am inclined to believe, in the labor of incubation and in feeding their young. The egg is rough, pure white, but with frequent discolorations, and, compared with size and weight of the parent, very large. It is an elongated oblong-oval, the smaller end being quite pointed. Length, 2.10; width, 1.40.

"I have not seen a chick, nor could I get any notes upon its appearance from the natives, but I have shot the young as they came out for the first time from their dark, secure hiding-places, fully fledged, with exception of crest, being by this time, the 10th to 15th August, as large as the old birds, and of the same color and feathering.

"The 'canooskie,' like its cousin, the 'choochkie,' has no sexual variation in size or plumage. Males and females are, to all external view, precisely alike.

"The bright crimson bill, however, varies considerably, not in color, but in its relative strength and curve, the slenderer bill not being confined, as far as I could see, to the young birds, some old ones having the light and more pointed beak."

We do not hesitate now to follow Professors Schlegel and Brandt in uniting the *dubia* and *tetracula* with the *cristatella* of Pallas. We were never satisfied of the distinction of the former, and in our Monograph expressed the strongest doubts of its validity as a species. The other, however, we fully believed, until recently, to be a good species.

624. **Simorhynchus pusillus,** (PALL.) COUES.—*Least, or Knob-billed, Auk.* "Chooch-kie."

? ? Alca pygmæa, GMELIN. Syst. Nat., i, 555, (1788.)—(*Nonne potius* =. *Alca camtschatica*, LEPECH., juv.; h. e. = *S. cassini*, NOB.?)
Phaleris pygmæa, BRANDT. Bull. Sc. Acad. St. Petersb., ii, 347, (1837.) (Excl. syn. *A. pygmæa*, GM.)
Tylorhamphus pygmæa, BP. Comptes Rendus, xlii, 774, (1806.) (=*Uria pusilla*, PALL.)
Simorhynchus pygmæus, SCHL. Mus. Pays-Bas., ix, 23, (1867.)
Uria pusilla, PALL. Zoog. R.-A., ii, 373, pl. 70, (1811.) (Excl. syn.)
Phaleris pusilla, CASS. Proc. Phila. Acad., 324, (1862.)
Phaleris (Ciceronia) pusilla, CASS. B. N. A., 909, (1858.)
Simorhynchus pusillus, COUES. Pr. Phila. Acad., (1868.)—BRANDT. Bull. Sc. Acad. St. Petersb., vii, 230, (1869.)—COUES. Key N. A. B., 343, figs. 227, 228, (1872.)

Phaleris corniculata, ESCHSCH. Zool. Atl., 4, pl. 16, (——.)
Phaleris microceros, BRANDT. Bull. Sc. Acad. St. Petersb., ii, 346, (1837.)
Phaleris (Ciceronia) microceros, CASS. B. N. A., 908, (1858.)
Ciceronia microceros, REICHENBACH.
Simorhynchus microceros, COUES. Proc. Phila. Acad., (1868.)
Phaleris nodirostra, BP. Comp. & Geog. List, 66, (1838.)
Ciceronia nodirostris, BP. Comptes Rendus, xlii, 774, (1856.)

There is now no reasonable doubt of the identity of the names above quoted, excepting *Alca pygmæa*, which remains unidentified. It may have been this species, but most probably it was the young of *S. camtschaticus*, in the same state as the young bird we recently called *S. cassini*. The strong doubt we expressed in our Monograph respecting the distinction between the *microceros* or *nodirostris* of authors and the *pusilla* of Pallas, has been confirmed.

"This little bird is the most characteristic of the water-fowl frequenting the Prybilov Islands, to which it repairs every summer by *millions* to breed, with its allies, *S. cristatella*, (canooskie,) and the *Phaleris psittacula*.

"It is comically indifferent to the proximity of man, and can be approached almost within an arm's length before taking flight, sitting upright and eyeing one with an air of great wisdom, combined with profound astonishment.

"Usually about the 1st or 4th of May, every year, the choochkie makes its first appearance around the Islands for the season, in small flocks of a few hundreds or thousands, hovering over and now and then alighting upon the water, sporting one with another, in apparent high glee, and making an incessant low chattering sound. By the 1st to the 6th June they have arrived in greatest number, and they then commence to lay. They frequent the loose stony reefs and boulder-bars on Saint Paul's, together with the cliffs on both Islands, and an area of over five square miles of basaltic shingle on Saint George's. On the last Island they hover in greatest number. There are millions of them. They make no nests, but lay a single egg each, far down below among loose rocks, or they deposit it deep within the crevices or chinks in the faces of the bluffs.

"Although, owing to their immense numbers, they seem to be in a state of great confusion, yet they pair off and conduct all of their billing and cooing down under the rocks, upon the spot chosen for incubation, making during this interesting period a singular grunting or croaking sound, more like a 'devil's fiddle' than anything I have ever heard outside of city limits.

"A walk over their breeding-grounds at this season is exceedingly interesting and amusing, as the noise of hundreds of these little birds directly under foot gives rise to an endless variation of sound, as it comes up from the stony holes and caverns below, while the birds come and go, in and out, with bewildering rapidity, comically blinking and fluttering.

"The male birds, and many of the females, regularly leave the breeding-grounds in the morning and go off to sea,

where they feed on small water-shrimps and sea-fleas, (*Amphipoda*,) returning to their nests and sitting partners in the evening.

"The choochkie lays a single pure white egg, exceedingly variable in size and shape, usually oblong-oval, with the smaller end somewhat pointed. I have several specimens almost spherical, and others drawn out into an elongated ellipse; but the oblong-oval, with the pointed smaller end, is the prevailing type. The egg is very large, compared with the size and weight of the little parent. Average length, 1.55; width, 1.12. The general aspect is much like that of a pigeon's egg, excepting the roughness of the shell.

"The chick is covered with a thick, uniform, dark, grayish-black down, which is speedily succeeded by feathers, all darker than those of the parent, when it takes flight from the Islands for the year, six weeks after. The parents feed their young by disgorging, and when the young birds leave, they are as large and heavy as the old ones. I am strongly inclined to think that the male bird feeds the female while incubating, but have not been able to verify this supposition by observation, as the birds are always hidden from sight at the time."

634. **Lomvia troile** var. **californica,** (BRY.) COUES.—*Murre Guillemot.*

Cepphus lomvia, PALL. Zoog. R. A., ii, 345, (1811.)
Uria troile, NEWB. Pac. R. R. Rep., vi, pt. iv, 110, (1857.)
Catarractes californicus, BRYANT. Proc. Bost. Soc. 11, fig. 3, 5, (1861.)
Lomvia californica, COUES. Proc. Phila. Acad., fig. 16, (1868.)
Lomvia troile var. *californica*, COUES. Key N. A. Birds, 346, (1872.)

All the Murres of the *troile* type we have seen from the North Pacific agree in possessing a particular shape of the bill, readily distinguishable from that presented by the Atlantic birds. While we would by no means insist upon, or even admit, that this is a specific character, especially since we have no doubt that some of the circumpolar colonies of these birds will show an intermediate style, we think it as well to recognize the character by a varietal name. The shape is difficult to describe in words: the gonydeal angle is stronger, pointed and more protuberant, the gonys straighter and more decidedly ascending, the culmen less deflected at the tip, and the commissure consequently straighter, than are these several points in true *troile*. The shape is only tolerably represented in our figure above quoted. It is, in short, some approach to the configuration of the bill in *L. svarbag*, (*brunnichii* of authors.)

"Limited numbers of the Californian guillemot are found occasionally perched on the cliffs with the '*arrie*'; they can only be distinguished at a slight distance by a practiced eye, for they resemble their allies so closely and conform so strictly to their habits, that it will be but repeating the description of the *L. arra*, given here, should I attempt it. The

largest gathering of these birds I have ever seen at any one place on the Islands was a squad of about fifty at the high bluffs on Saint George's, last summer; but they are generally scattered by ones, twos, and tnrees, among thousands and tens of thousands of the arra."

635. **Lomvia arra,** (PALL.) COUES.—*Thick-billed Guillemot.* "Arrie."
Cepphus arra, PALL. Zoog. R.-A., ii, 347, (1811.)
Uria arra, CASS. Proc. Phila. Acad., 324, (1862.)
(Also, *Uria brünnichii*, &c., of authors referring to the North Pacific thick-billed bird.)

It is an interesting fact that these specimens, unquestionably of the "thick-billed" guillemot, do not exhibit the extreme shortness and stoutness of bill shown by those of the North Atlantic, the bill being almost exactly intermediate. With the chord of culmen about $1\frac{2}{3}$ inches long, the depth of the bill opposite the nostrils is hardly, or not, $\frac{2}{3}$ of an inch, and thus much less than half as long, instead of about half as long. The gape is about 3 inches. While the bill shows the dilated and denuded basal portion of the maxillary tomium, characteristic of the species, this raised, naked border is not yellowish, but of a peculiar glaucous bluish-gray color. The tip of the bill is less hooked than in true "*brünnichii*," though more so than in *troile*. The modification of the bill appears somewhat singularly analogous to that which takes place in var. *californica* as compared with true *troile*.

This bird is, of course, the true *arra* of Pallas, (a name apparently derived from the Russian vernacular,) whatever be its relationship to the Atlantic bird. We should not be surprised if some of the circumpolar forms were to connect the extremes of *brünnichii* and *troile* by insensible gradations.

"The great egg-bird of the North Pacific, frequenting these Islands by millions. This *Uria* and one other, the var. *californica*, are the only birds of the genus found here, but the latter is in comparatively no number whatever, not one being seen where a thousand of the former are visible at once.

"They appear very early in the season, but do not begin to lay until the 18th or 25th of June, and the natives tell me that in open, mild winters these birds are seen in straggling flocks all around the Islands. I feel quite well assured that all the individuals do not migrate from this sea and the vicinity of the Aleutian Islands.

"They lay their eggs upon the points and narrow shelves on the faces of the cliff-fronts to the Islands, standing over the eggs, side by side, as thickly as they can crowd, making no nests. They quarrel desperately, and so earnestly that all along under the high bluffs on the north shore of Saint George's hundreds of dead birds are lying, having fallen and dashed themselves to death upon the rocks while clinched in combat with rivals in mid-air.

"They lay but a single egg, upon the bare rock. The egg is large and very fancifully colored, a bluish-green ground with dark-brown mottlings and patches, but exceedingly variable in size and coloring. The outline of the egg is pyriform,

sometimes more acute. It is the most palatable of all the varieties found on the Islands, having no disagreeable flavor, and when perfectly fresh being fully as good as a hen's egg.

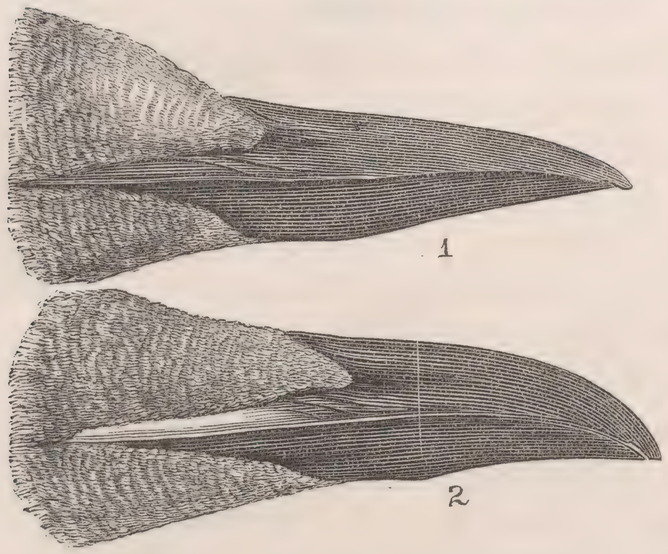

Fig. 1.—*Lomvia troile* var. *californica.*
Fig. 2.—*Lomvia arra.*

"Incubation lasts nearly twenty-eight days, and the young come out with a dark thick coat of down, which is speedily supplanted by the plumage and color of the old birds, within six weeks from hatching. They are fed by the disgorging parents, apparently without intermission, uttering all the while a harsh rough croak, lugubrious enough.

"The males and females have no sexual distinction as to size, shape, or plumage. On Saint George's Island, while the females begin to set, along toward the end of June and first of July, the males go flying around the Island in great files and platoons, always circling against, or quartering on, the wind, at regular hours in the morning and the evening, *making a dark girdle of birds more than a quarter of a mile broad and thirty miles long, whirling round and round the Island,* and forcing upon the most casual observer a lasting impression. The flight of the 'arrie' is straight, steady, and rapid, the wings beating quickly and powerfully; it makes no noise nor utters any cry, save a low, hoarse, grunting croak, and then only when quarreling or mating.

"This 'arrie' is a valuable bird to the inhabitants of the Seal Islands, and, indeed, for that matter, is the only one that has much economic worth to man in Behring Sea."

THE CLIMATOLOGY OF THE PRYBILOV ISLANDS.

The climate of the Islands has received careful attention from the United States Signal Service, Division of Telegrams and Reports for the Benefit of Commerce and Agriculture. Mr. Chas. P. Fish has made an exceedingly exhaustive and full report to the Chief Signal-Officer of the Army, at Washington, and which will be published soon. It is so complete that I shall refer all to it who may wish to watch the weather closely through a year, or years, on the Seal Islands, and simply note here that the winter of 1872–'73 was one of great severity, according to the natives, much more so than usual, it being generally very much warmer; but, cold as it was, the lowest marking by the thermometer was 12° below zero, and that for a few hours only during one day in February, while the mean of the month was but 18° above. The coldest month, March, gave a mean of 12° above, while the usual winters have a mean of only 22° or 26°; but the high north winds, blowing more than three-fourths of the time, make all out-door exercise impracticable; for instance, one day in March, 1873, it blew at the rate of eighty-eight miles per hour with as low a temperature as —4°! With a wind traveling only twenty-four or twenty-five miles an hour, at a much higher temperature, as at 15° or 16° above, it is necessary to be most thoroughly wrapped up to guard against freezing, if any journey is to be made over the Islands.

There are but two seasons, winter and summer. To the former belong November, December, January, February, March, and April, with a mean of 20° to 28°, while the transition to summer is but a slight elevation in temperature, only 15° to 20°, and of the summer months, July is the warmest, with a mean of 48° or 50°.

It is astonishing how rapidly snow melts here at a single degree above freezing, and after several consecutive days at 34° and 36°, grass begins to grow, even if it be under melting drifts and the frost is many feet deep in the ground. The report of Mr. C. P. Fish, Signal Service, United States Army, cannot fail to be of great interest to meteorologists who will find subjects for much thought and reflection in its elaborate details; and with the permission of the Chief Signal-Officer, I compiled the following table from the reports of his office, showing the range of barometer, thermometer, wind, cloudiness, &c., during a severe winter on Saint Paul's Island.

Meteorological abstract for the months from September, 1872, to April, 1873, inclusive, made by the Observer, United States Signal-Service, at the office of the Chief Signal-Officer, United States Army, Division of Reports and Telegrams for the Island of Saint Paul, Behring's Sea, for the Benefit of Commerce and Agriculture.

Month of record.	September.	October.	November.	December.	January.	February.	March.	April.
Mean of barometer, corrected	29.773	29.512	29.458	29.488	29.953	29.507	29.768	29.769
Maximum of barometer, corrected	30.46	30.04	30.23	30.04	30.50	30.51	30.31	30.35
Minimum of barometer, corrected	28.87	28.51	28.62	28.05	29.32	28.26	29.05	29.00
Monthly range of barometer, corrected	1.59	1.53	1.61	1.99	1.18	2.25	1.26	1.35
Greatest daily range of barometer, corrected	.97	.97	.87	.80	.58	.95	.66	.73
Least daily range of barometer, corrected	.03	.04	.06	.03	.03	.06	.05	.03
Mean daily range of barometer, corrected	.259	.293	.339	.249	.194	.421	.219	.242
Mean of exposed thermometer	44°.2	36°.0	34°.3	26°.6	15°.7	18°.6	12°.6	23°.9
Maximum of exposed thermometer	52°	45°	41°	37°	34°	34°	35°	35°
Minimum of exposed thermometer	33°	22°	23°	4°	−11°	−12°	− 7°	3°
Monthly range of exposed thermometer	19°	23°	18°	33°	45°	46°	42°	32°
Greatest daily range of exposed thermometer	11°	11°	12°	11°	22°	28°	20°	24°
Least daily range of exposed thermometer	1°	1°	1°	1°	0°	3°	3°	3°
Mean of maxima of exposed thermometer	46°.8	38°.7	36°.2	29°.1	18°.9	22°.6	17°.1	27°.9
Mean of minima of exposed thermometer	41°.8	33°.3	31°.5	24°.	11°.9	15°.1	7°.4	19°.4
Mean daily range of exposed thermometer	5°.0	5°.4	4°.7	5°.1	7°.0	7°.5	9°.7	8°.5
Mean relative humidity	85.6	83.9	86.6	87.8	85.7	86.2	81.8	84.29
Maximum relative humidity	100.	100.	100.	100.	100.	100.	100.	100.
Minimum relative humidity	56.	65.	60.	70.	53.	49.	46.	63.
Prevailing wind	N.	N.	S.	N.	E. N. E.	N.	N.	N.
Number of miles traveled by wind	9,138	11,872	14,539	16,644	17,903	16,646	14,512	18,607
Mean daily velocity of wind	304.6	383	484.6	530.5	577.5	594.3	468.1	620.2
Mean hourly velocity of wind	12.7	16	20.2	22.1	24.1	24.8	19.5	25.84
Maximum hourly velocity of wind	33.	42	74.	53.	43.	82.	88.	53
Proportion of cloudiness	92	84	78.9	84	62.8	74.9	68.	73.6
Amount of rain-fall, in inches	2.89	3.08	2.38	2.99	0.96	5.78	1.21	1.77
Greatest daily amount of rain-fall	.85	.58	.31	.42	.39	1.07	.38	.50
Amount of melted hail and snow, (included in rain-fall)	.20	.91	.82	2.38	.83	4.87	1.21	1.77
Number of days on which precipitation occurred	30.	29.	27.	27.	21.	27.	27.	26.
Number of days on which hail or snow fell	4.	15.	17.	24	20.	25.	27.	26.

NOTE.—It will be noticed that I have spelled the name *Behring* in accordance with the usual custom observed by English writers who have thus given the phonetic value of the Sclavonic characters used by the Russians in writing the name of this celebrated navigator; but by reference to the following statement made by Professor Gill, of the Congressional Library, it will be seen that the name in question may properly be spelled "*Bering*." Professor Gill says: "The name of the navigator which has been conferred on the strait separating America and Asia, is unquestionably spelled BERING and not BEHRING. I submit, in explanation, my reasons: 1st. The navigator himself was born in Jutland, and a scion of a Danish family, whose members bore the name of Bering, and two representatives of which had the same christian name, viz, (1) Vitus Bering, born 1617, died 1675, sometime professor of poetry at Copenhagen, and (2) Vitus Bering, born 1682, died 1753, a priest of Ollerup and Kirkeby. The form *Behring*, so far as I can ascertain, is unknown in Denmark, (see Nyerup's Dansk-Norsk Litteratur-lexicon, v. i, pp. 56, 57, 1818.) 2d. The form *Bering* is almost (but not quite) universally adopted in all non-English works; for example, Biographie Universelle, (Michaud,) v. 4, p. 261, 1811, also, nouv. ed. v. 4, p. 28, 1854; Nouvelle Biographie Générelle, (Hoefer,) v. 5, p. 527, 1855; Allgemeine Encyclopädie der Wissenschaften und Künste, (Ersch und Gruber,) v. 9, p. 136, 1822; Neues Konversations-Lexicon, (Meyers,) v. 3, p. 238, 1862; Deutsch-Amerikanisches Conversations-Lexicon, (Schem,) v. 2, p. 296, 1869, and numerous others. The exceptional cases, e. g. Pierers Universal Lexicon, Grande Dictionaire Universelle du xix. siécle, &c. In English dictionaries, the true form *Bering* is adopted in the Brief Biographical Dictionary, by Holes, 1865, and the Dictionary of Biographical Reference, by Phillips, 1871, and is gradually superseding the more familiar English form. An explanation of the reason of the origin of the name *Behring* is found in the fact that it was originally derived from the Russian, without a knowledge of its primitive source, and was the nearest English phonetic expression of the Russian characters. Inasmuch, however, (1) as the original form of a name, without regard to its pronunciation, is universally adopted in our biographies and bibliographies, and (2) as the original form of the navigator's name was *Bering*, such is the correct one, and that which must ultimately supersede the other. It need only be added that Bering himself, and the Russians universally, (?) adopt that form when writing in English characters, and that the Russian letter ('e') in his name, represented by '*eh*,' is especially ordained by the Russians to be rendered by the latin character 'e,' in accordance with the pronunciation of the latin and continental races generally."

AN ACT TO PREVENT THE EXTERMINATION OF FUR-BEARING ANIMALS IN ALASKA.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be unlawful to kill any fur-seal upon the Islands of Saint Paul's and Saint George's, or in the waters adjacent thereto, except during the months of June, July, September, and October, in each year; and it shall be unlawful to kill such seals at any time by the use of fire-arms, or use other means tending to drive the seals away from said Islands: *Provided*, That the natives of said Islands shall have the privilege of killing such young seals as may be necessary for their own food and clothing during other months, and also such old seals as may be required for their own clothing and for the manufacture of boats for their own use, which killing shall be limited and controlled by such regulations as shall be prescribed by the Secretary of the Treasury.

SEC. 2. *And be it further enacted*, That it shall be unlawful to kill any female seal, or any seal less than one year old, at any season of the year, except as above provided; and it shall also be unlawful to kill any seal in the waters adjacent to said Islands, or on the beaches, cliffs, or rocks where they haul up from the sea to remain; and any person who shall violate either of the provisions of this or the first section of this act, shall be punished on conviction thereof, for each offense, by a fine of not less than two hundred dollars nor more than one thousand dollars, or by imprisonment not exceeding six months, or by both such fine and imprisonment at the discretion of the court having jurisdiction and taking cognizance of the offense; and all vessels, their tackle, apparel, and furniture, whose crew shall be found engaged in the violation of any of the provisions of this act shall be forfeited to the United States.

SEC. 3. *And be it further enacted*, That for the period of twenty years from and after the passage of this act the number of fur-seals which may be killed for their skins upon the Island of Saint Paul's is hereby limited and restricted to seventy-five thousand per annum; and the number of fur-seals which may be killed for their skins upon the Island of Saint George's is hereby limited and restricted to twenty-five thousand per annum: *Provided*, That the Secretary of the Treasury may restrict and limit the right of killing, if it shall become necessary for the preservation of such seals, with such proportionate reduction of the rents reserved to the Government as shall be right and proper; and if any person shall knowingly violate either of the provisions of this section, he shall, upon due conviction thereof, be punished in the same way as is provided herein for a violation of the provisions of the first and second sections of this act.

SEC. 4. *And be it further enacted*, That immediately after the passage of this act the Secretary of the Treasury shall lease, for the rental mentioned in section 6 of this act, to proper and responsible parties, to the best advantage of the United States, having due regard to the interests of the Government, the native inhabitants, the parties heretofore engaged in the trade, and the protection of the seal-fisheries, for a term of twenty years from the 1st day of May, 1870, the right to engage in the business of taking fur-seals on the Islands of Saint Paul's and Saint George's, and to send a vessel or vessels to said Islands for the skins of such seals, giving to the

lessee or lessees of said Islands a lease duly executed, in duplicate, not transferable, and taking from the lessee or lessees of said Islands a bond, with sufficient sureties, in a sum not less than $500,000, conditional for the faithful observance of all the laws and requirements of Congress and of the regulations of the Secretary of the Treasury touching the subject-matter of taking fur-seals and disposing of the same, and for the payment of all taxes and dues accruing to the United States connected therewith. And in making said lease the Secretary of the Treasury shall have due regard to the preservation of the seal-fur trade of said Islands, and the comfort, maintenance, and education of the natives thereof. The said lessees shall furnish to the several masters of vessels employed by them certified copies of the lease held by them, respectively, which shall be presented to the Government revenue-officer for the time being who may be in charge at the said Islands, as the authority of the party for landing and taking skins.

SEC. 5. *And be it further enacted*, That at the expiration of said term of twenty years, or on surrender or forfeiture of any lease, other leases may be made in manner as aforesaid for other terms of twenty years; but no persons other than American citizens shall be permitted, by lease or otherwise, to occupy said Islands, or either of them, for the purpose of taking the skins of fur-seals therefrom, nor shall any foreign vessel be engaged in taking such skins; and the Secretary of the Treasury shall vacate and declare any lease forfeited if the same be held or operated for the use, benefit, or advantage, directly or indirectly, of any person or persons other than American citizens. Every lease shall contain a covenant on the part of the lessee that he will not keep, sell, furnish, give, or dispose of any distilled spirits or spirituous liquors on either of said Islands to any of the natives thereof, such person not being a physician and furnishing the same for use as medicine; and any person who shall kill any fur-seal on either of said Islands, or in the waters adjacent thereto, (excepting natives as provided by this act,) without authority of the lessees thereof, and any person who shall molest, disturb, or interfere with said lessees, or either of them, or their agents or employés in the lawful prosecution of their business, under the provisions of this act, shall be deemed guilty of a misdemeanor, and shall for each offense, on conviction thereof, be punished in the same way and by like penalties as prescribed in the second section of this act; and all vessels, their tackle, apparel, appurtenances, and cargo, whose crews shall be found engaged in any violation of either of the provisions of this section, shall be forfeited to the United States; and if any person or company, under any lease herein authorized, shall knowingly kill, or permit to be killed, any number of seals exceeding the number for each Island in this act prescribed, such person or company shall, in addition to the penalties and forfeitures aforesaid, also forfeit the whole number of the skins of seals killed in that year, or, in case the same have been disposed of, then said person or company shall forfeit the value of the same. And it shall be the duty of any revenue officer, officially acting as such on either of said Islands, to seize and destroy any distilled spirits or spirituous liquors found thereon: *Provided*, That such officer shall make detailed report of his doings to the collector of the port.

SEC. 6. *And be it further enacted*, That the annual rental to be reserved by said lease shall be not less than $50,000 per annum, to be secured by deposit of United States bonds to that amount, and in addition hereto a revenue tax or duty of two dollars is hereby laid upon each fur-seal skin taken and shipped from said Islands during the continuance of such lease, to be paid into the Treasury of the United States; and the Secretary of the Treasury is hereby empowered and authorized to make all needful rules and regulations for the collection and payment of the same, for the comfort, maintenance, education, and protection of the natives of said Islands, and also for carrying into full effect all the provisions of this act: *Provided further*, That the Secretary of the Treasury may terminate any lease given to any person, com-

pany, or corporation, on full and satisfactory proof of the violation of any of the provisions of this act or the rules and regulations established by him: *Provided further*, That the Secretary of the Treasury is hereby authorized to deliver to the owners the fur-seal skins now stored on the Islands, on the payment of one dollar for each of said skins taken and shipped away by said owners.

SEC. 7. *And be it further enacted*, That the provisions of the seventh and eighth sections of an act entitled "An act to extend the laws of the United States relating to customs, commerce, and navigation over the territory ceded to the United States by Russia, to establish a collection-district therein, and for other purposes," approved July 27, 1868, shall be deemed to apply to this act; and all prosecutions for offenses committed against the provisions of this act, and all other proceedings had because of the violations of the provisions of this act, and which are authorized by said act above mentioned, shall be in accordance with the provisions thereof; and all acts and parts of acts inconsistent with the provisions of this act are hereby repealed.

SEC. 8. *And be it further enacted*, That the Congress may at any time hereafter alter, amend, or repeal this act.

Approved, July 1, 1870.

BY-LAWS OF THE ALASKA COMMERCIAL COMPANY, SAN FRANCISCO, CALIFORNIA.

I. The corporate name of this company is the Alaska Commercial Company, and its affairs are under the control of five trustees, who shall hereafter be chosen by the stockholders of the company on the second Wednesday of June in each year, and who shall hold office until their successors are elected. The annual meetings of the stockholders shall be held at the office of the company. At all elections of trustees by the stockholders each stockholder shall be entitled to one vote for every share of stock held by him on the books of the company. Stockholders may vote by proxy. All proxies shall be signed by the party owning the stock represented.

II. The principal place of business of the company is San Francisco, California.

III. The regular meetings of the board of trustees will be held at the office of the company on the first Wednesday in each month, at 12 o'clock m., and no notice of such meeting to any of the trustees shall be requisite. Other meetings of the board of trustees may be held upon the call of the president, by notice, signed by him, of the time and place of meeting, personally served on each trustee residing within this State, or published in a newspaper of general circulation in San Francisco for ten days successively next preceding the day of such meeting. Special meetings may be held upon notice, signed by three trustees, stating the time and place of meeting, and the purpose for which the meeting is called, having been duly served on each trustee, or published in a newspaper of general circulation in San Francisco for ten days successively next preceding the day of meeting, and no business other than that specified in the notice shall be transacted at such special meeting. At all meetings of the board any three of the trustees being present shall constitute a quorum for the transaction of the business of the company. Adjourned meetings may be held in pursuance of a resolution of the board adopted at any regular or general meeting of the board. Any three trustees elected at any annual meeting of the stockholders of the company, and being present at the close of such stockholders' meeting, may, on the same day, without notice to any of the trustees, meet and organize the board by the election of officers, and may transact such other business as may come before the board at such meeting.

IV. The officers of the company shall consist of a president, a vice-president, and a secretary, who shall be chosen by the board of trustees at their first meeting after the annual election of trustees; such officers to hold office one year, or until their successors are elected.

V. The president, or in his absence the vice-president, shall preside at the meetings of the board. In case neither are present, the board may appoint a president *pro tempore*.

VI. All vacancies in the board may be filled by the board at the next meeting after the existence of such vacancy, and it shall require the affirmative vote of three trustees to elect. In case of any vacancy occurring among the officers or agents of the company, the same may be filled at any meeting of the board.

VII. All certificates of the capital stock of the company shall be signed by the president and secretary, attested by the corporate seal of the company, and can be issued to the

parties entitled thereto or their authorized agent. All transfers of stock shall be made on the books of the company by the secretary, upon surrender of the original certificate or certificates, properly indorsed by the party in whose favor the same was issued. No stock shall be transferred to any person not a stockholder of the company at the time of such transfer, unless the same shall have been offered for sale to the company, or stockholders of the company, and the purchase at the fair cash or market value refused, except by authority of a resolution of the board of trustees permitting such transfer.

VIII. The corporate seal of the company consists of a die of the following words: "Alaska Commercial Company, San Francisco, California."

IX. The corporate seal, and all property, securities, interests, and business of the company, shall be under the control and general management of the president, subject to the direction of the board of trustees. The funds of the company shall be deposited (from time to time, as they are received) to the credit of the company, with a bank doing business in San Francisco, to be designated by the president, and the said funds can be drawn from such bank only by proper checks or drafts, signed by the president or vice-president of the company. The books of the company shall be kept by the secretary, who shall also keep a correct record of all the proceedings of the board of trustees had at their meetings, and perform such other duties as the board of trustees may require.

X. The pay and salaries of all officers of the company shall be determined, from time to time, by the board of trustees.

XI. The president of the company shall have power to appoint and employ such general business-agents, factors, attorneys, clerks, and other employés as he may deem proper and requisite for conducting the business and affairs of the company; and he shall fix the pay, commissions, or salaries of all such agents, factors, attorneys, clerks, and other employés, from time to time, as circumstances shall require.

XII. All transfers of the capital stock of this company made to persons not citizens of the United States, or made for the use or benefit of any citizen or citizens of any foreign government, are absolutely void.

XIII. Dividends from the net profits of the company may be declared and paid by order of the board of trustees, in accordance with law.

XIV. These by-laws may be altered or amended by the board of trustees in the manner prescribed by law.

REGULATIONS.

OFFICE ALASKA COMMERCIAL COMPANY,
San Francisco, January, 1872.

The following regulations are prescribed for the guidance of all concerned:

1. The general management of the company's affairs on the Islands of Saint Paul's and Saint George's is intrusted to one general agent, whose lawful orders and directions must be implicitly obeyed by all subordinate agents and employés.

2. Seals can only be taken on the Islands during the months of June, July, September, and October in each year, except those killed by the native inhabitants, for food and clothing, under regulations prescribed by the Secretary of the Treasury.

Female seals and seals less than one year old, will not be killed at any time, and the killing of seals in the waters surrounding the Islands, or on or about the rookeries, beaches, cliffs, or rocks, where they haul up from the sea to remain, or by the use of fire-arms, or any other means tending to drive the seals away from the Islands, is expressly forbidden.

3. The use of fire-arms on the Islands, during the period from the first arrival of seals in the spring season, until they disappear from the Islands in autumn, is prohibited.

4. No dogs will be permitted on the Islands.

5. No person will be permitted to kill seals for their skins on the Islands, except under the supervision and authority of the agents of the company.

6. No vessels other than those employed by the company, or vessels of the United States, will be permitted to touch at the Islands, or to land any persons or merchandise thereon, except in cases of shipwreck, or vessels in distress.

7. The number of seals which may be annually killed for their skins on Saint Paul's Island is limited to seventy-five thousand, and the number which may be so killed on Saint George's Island is limited to twenty-five thousand.

8. No persons other than American citizens, or the Aleutian inhabitants of said Islands, will be employed by the company on the Islands in any capacity.

9. The Aleutian people living on the Islands will be employed by the company in taking seals for their skins, and they will be paid for the labor of taking each skin and delivering the same at the salt-house forty cents, coin, until otherwise ordered by the Secretary of the Treasury. For other labor performed for the company, proper and remunerative wages will be paid, the amount to be agreed upon between the agents of the company and the persons employed. The working-parties will be under the immediate control of their own chiefs, and no compulsory means will ever be used to induce the people to labor. All shall be free to labor or not, as they may choose. The agents of the company will make selection of the seals to be killed, and are authorized to use all proper means to prevent the cutting of skins.

10. All provisions and merchandise required by the inhabitants for legitimate use will be furnished them from the company's stores, at prices not higher than ordinary retail prices at San Francisco, and in no case at prices above 25 per cent. advance on wholesale or invoice prices in San Francisco.

11. The necessary supplies of fuel, oil, and salmon will be furnished the people *gratis*.

12. All widows and orphan children on the Islands will be supported by the company.

13. The landing or manufacture on the Islands of spirituous or intoxicating liquors or wines will under no circumstances be permitted by the company, and the preparation and use of fermented liquors by the inhabitants must be discouraged in every legitimate manner.

14. Free transportation and subsistence on the company's vessels will be furnished all people, who at any time desire to remove from the Islands to any place in the Aleutian group of Islands.

15. Free schools will be maintained by the company eight months in each year, four hours per day, Sundays and holidays excepted, and agents and teachers will endeavor to secure the attendance of all. The company will furnish the necessary books, stationery, and other appliances for the use of the schools, without cost to the people.

16. The physicians of the company are required to faithfully attend upon the sick; and both medical attendance and medicines shall be free to all persons on the Islands; and the acceptance of gratuities from the people for such services is forbidden.

17. The dwelling-houses now being erected by the company, will be occupied by the Aleutian families, free of rent or other charges.

18. No interference on the part of agents, or employés of the company, in the local government of the people on the Islands, or in their social or domestic relations, or in their religious rites or ceremonies, will be countenanced or tolerated.

19. It is strictly enjoined upon all agents and employés of the company to at all times treat the inhabitants of the Islands with the utmost kindness, and endeavor to preserve amicable relations with them. Force is never to be used against them, except in defense of life, or to prevent the wanton destruction of valuable property. The agents and employés of the company are expected to instruct the native people in household economy, and, by precept and example, illustrate to them the principles and benefits of a higher civilization.

20. Faithful and strict compliance with all the provisions and obligations contained in the act of Congress entitled "An act to prevent the extermination of fur-bearing animals in Alaska," approved July 1, 1870, and the obligations contained in the lease to the company executed in pursuance of said act, and the regulations of the Secretary of the Treasury, prescribed under authority of said act, is especially enjoined upon all agents and employés of the company. The authority of the special agents of the Treasury, appointed to reside upon the islands, must be respected, whenever lawfully exercised. The interest of the company in the management of the seal-fisheries being identical in character with that of the United States, there can be no conflict between the agents of the company and the agents of the Government, if all concerned faithfully perform their several duties and comply with the laws and regulations.

21. The general agent of the company will cause to be kept books of record on each Island, in which shall be recorded the names and ages of all the inhabitants of the Islands, and, from time to time, all births, marriages, and deaths which may occur on the Islands, stating, in cases of death, the causes of the same. A full transcript of these records will be annually forwarded to the home office at San Francisco.

22. Copies of these regulations will be kept constantly posted in conspicuous places on both Islands, and any wilfull violation of the same by the agents or employés of the company will be followed by the summary removal of the offending party.

JOHN F. MILLER,
President Alaska Commercial Company.